1   AT THIS POINT, I AM STARTING 238.DOC, THE YEAR 1971. THIS IS THE YEAR THAT COSATI WAS TRANSFERRED TO NSF, HENCE THE AAA MEMORANDA TO THE SCIENCE ADVISOR WILL END.

The 1970 bibliographic references ended with (184). The 1971 references start with (185).

International

The United Nations Food and Agricultural Organization (FAO) has appointed an advisory panel to consider the development of an international information system for the agricultural sciences. John Sherrod, a member of COSATI, represented the United States. The Soviet Union and England agreed to undertake a program to improve the flow of STI. Targetted areas were information systems for physics, electronics, and electrotechnology. VINITI favored joining the British in the use of the INSPEC selective dissemination of information program. Following the lead of the United States in supporting important scientific information centers, the University of Sheffield, with the support of a U.K. grant, established the Intestinal Absorption Information Center. The Center also disseminates the Intestinal Absorption Bulletin, a current awareness publication, containing brief abstracts, and computer-produced author and subject indexes. The British government, which has made MEDLARS available since May 1966 without cost, has changed its policy and, like Sweden, has shifted to providing the service for a fee.

(185) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Intelligence and Commentary, January 10, 1971, pp 4.

OST

The notion that the national problem with drugs is a new phenomenon is inaccurate. The National Clearinghouse for Drug Abuse Information took a full-page advertisement in Newsweek (January 4, 1971), which started off with the statement: "Your kid shouldn't know more about drugs than you do." Readers were invited to send for a free book described as a Federal Source Book that provided additional information. Based on the increased use of dangerous drugs over the intervening years, it would appear that the campaign did not succeed (185). The Smithsonian Science Information Exchange worked out an agreement with the American Psychological Association, whereby listings of ongoing research projects would appear quarterly in a new APA publication, Behavioral Science in Progress. The Defense Documentation Center began to produce its Technical Abstract Bulletin (TAB) on magnetic tape, and magnetic tape copies of the ERIC master files were being marketed by Leasco Systems and Research Corporation Research Corporation. NTIS raised the price of copies of government technical reports from 65 cents to 95 cents. Hard copy technical reports were being sold for $3.00 and up, depending on size. Per item cost cost is many times higher currently. The wares of the Chemical Abstract Services were increasing in size and number, which forced CAS to shift to the use of more high-powered IBM computers. The American Institute of Physics announced the availability of SPIN: Searchable Physics Information Notices on magneic tape. This is a monthly file of primary journal literature generated by the National Information System

for Physics and Astronomy (NISPA). AIP decided to lease or license its magnetic tapes for an estimated fee of $2,500 for 12 months (185). A new trend was on its way.

Science Information Exchange

The function and locus of the Smithsonian Science Information Exchange continued to plague us. We learned that OMB had concluded after a study of SIE in 1970 that it should remain in the Smithsonian Institution and funded directly as a Smithsonian operation and not through NSF. It had been OST's recommendation that SIE be combined with the Commerce Department's Clearinghouse for Scientific and Technical Information to provide one-stop service to users interested in ongoing and completed research information. This would reduce one overhead and provide economies to the users. Commerce had already changed the Clearinghouse of Federal STI to the National Technical Information Service to provide scientific and economic information to users. A letter was prepared for Dr. David's signature to George P. Schultz, OMB's director, stating, in part:

The appropriateness of assigning a Smithsonian component the function of managing a government-wide management information role is questionable. In fact, the overall performance of SIE in the area of physical sciences and engineering data is open to question, although SIE is believed to be adequate in the life sciences area. Physical sciences, of course, account for the major part of Federal science expenditures. Congressional interest in the problem of management in this area has been high. Senator Mansfield has shown concern for defense-related programs and the lack of adequate information about projects. Representative Emilio Daddario specifically recommended that SIE be used as the basis for a government-wide information service on all federally supported R&D activities, a rather questionable approach...According to NSF studies, SIE is relatively little used by the physical science-engineering community, hence by most of the Federal R&D agencies. Reportiong by this community to SIE is particularly weak, and this, of course, affects the frequency and utility of search requests. We must face the fact that it is not the practice of the Federal agencies, especially those involved with the physical sciences to search the rather inadequate SIE files before embarking on new R&D programs. A larger and more critical issue than the disposition of SIE is how information related to management of Federal science and technology programs is to be handled. Involved in this issue are the matters of improving interagency coordination, the need for sounder internal management of R&D programs, and an innate reluctance of some scientists to take the trouble to doc ument their activities properly. The problem is complex; it involves management, communication and science. It affects the performance and budget of many agencies and, increasingly, the relations between the Executive Branch and Congress.

The information about OMB's proposed solution, based on its 1970 study, were relayed to Mr. Beckler by Hubert Loweth, OMB, in a private meeting. It was suggested to David Z. Beckler, OST, by me that OST and OMB authorities meet once again to arrive at the best course of action for the government (186). Earlier, OMB had agreed on transferring the SIE function to the Department of Commerce, but had been side-tracked because of the difficulty of transferring SIE's personnel into the civil service. OMB

apparently found it easier to continue the status quo and provide the funds, which had been in the NSF budget, directly to the Smithsonian Institution to operate SIE. This situation continued for a few years until Congress became dissatisfied with the way Smithsonian Institution leadership handled its appropriated funds. As reported elsewhere in this book, at that time the SIE function was transferred to the NTIS without funds or personnel. The advice for this decision was made by the new Office of Science and Technology Policy. When the Grace Cost-Cutting Survey panel made its study in the 19890s, it suggested that the funding be restored to NTIS and a stronger program be put in place. This has not happened. Congress, which had been a staunch supporter of the government-wide R&D project-reporting program, has been strangely silent in the last few years. .

(186) Aines, Andrew A., OST, Internal Memorandum to David Z. Beckler, Assistant Director, OST, suggesting an OST-OMB meeting, and providing a proposed memorandum to be sent to OMB's director, George P. Schultz, and signed out by Dr. David.

International
Like most of the major governments in the world, the French government, during the 1960s and 1970s, was in a ferment, insofar as national information policies and modern information systems were concerned. For this reason, a presentation made by a senior French data processing official, M Allegre, received considerable attention in France and among the members of the OECD Information Policy Group (187).
(187) Allegre, M., Delegue a l'Information, French Government, Presentation at the founding session of the French Data Bank Club, Subject: The Policy of the French Delegation a L'Informatique in Regard to Government Data Banks, DAS/SPR/70.75, Organization for Economic Cooperation and Development, December 23, 1970, pp 11.
Following are a few of the remarks made by Allegre:
Data banks to me are sets of coherent data of any kind which can be, or are already, compiled and processed by means of automatic data-processsing techniques. In light of the development of new hardware (bulk memories) and software (management systems, question and answer files, etc.), we have come to realize that modern society increasingly needs data on subjects collected at certain points, and that from 1970 onwards these data can only be processed by computer-based systems. The problem exists for both the public and the private sectors. There are a few principles to be adopted: l. We cannot sit idly by; government must automate and create needed databases. 2. The raw material of government departments is the considerable store of raw data already accumulated. These must be organized, used, and made available to other government units. 3. A decision has to be made about centralization and decentralization, which will depend on how a government is organized. Regionalization is another approach. In France, I suspect that there would be a huge network of data banks, rather than complete centralization. Reasonable access to the data banks should be provided for those outside of the inner circle of users, but steps should be taken to maintain confidentiality to protect the privacy of individuals Between 1970 and 1975. I would advise the Government to conduct a number of important, significant pilot experiments in gradually building the information systems. In so doing, I would expect that we will take advantage of what other countries have

done, as the United States, which certainly has moved farthest ahead in this field. We must learn from the mistakes of other countries, but avoid slavishly copying them. As we move towards automatic data processing and data bases, remember that they are not ends in themselves. A number of technical fields are emerging where the data bank system is essential, as, for instance, in connection with electronic components used in the manufacture of electronic circuits by automation. We must take advantage of the growth of software programs and learn how to share them. We need a symbiotic relationship between government departments undertaking sophisticated pilot data bank experiments and French companies producing hardware and software , in such a way that the two objectives can be attained side by side, one consisting of promoting the use of ADP through the medium of data banks and the other of developing a genuine French computer industry, an essential economic requirment of modern countries. We are still very far from creating a vast integrated management information system within the government. Reaching that goal will take a long time, if ever we are to achieve it. Progress is being made, but the pilot experiments we undertake during the next five years will be crucial. Dr. David responded to these comments with an observation that Allegre failed to mention the need for data security. I agreed with Dr. David and added this comment:

The privacy issue has all but crowded the data security problem off the front page, something we ought to say something about in our progress report. I agree that government agencies in the U.S.A. at all levels are computerizing rapidly, as they are provided funds. In the long run, I believe that computers and other communications/information technology will tend to change the work patterns of tovernment and, in turn, the organization of government. At the outset, computerization is superimposed on operations as practiced, but in the long run, computers will tend to dictate that operations be built around what they cvan really do. Getting all governments to think along the lines of Allegre's thinking in this respect will be a forward step, I believe (198).

(188) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Weekly Report, January 16, 1971.

International

The thrust towards the internationalization of STI continued during this period. Lewis Branscomb continued to represent the United States government in some arenas. In our interaction with Dr. Branscomb, we wrote to him letting him know that OST was fully behind strong action to organize the CODATA program, but our support for the UNISIST program during its planning stage was fairly firm, but support for the total program would not be publicly demonstrated until we had more internal agreement and a better understanding of the relationship of this program with our own. Hans Gassmann, Executive Secretary of the OECD Computer Utilization Group, visited OST on two occasions, meeting with the OST authorities and Addison Richmond and Peter Dodd of the State Department. Our discussions centered on the American recommendation to OECD that it reorganize its information programs by combining the Information Policy Group and the Computer Utilization Group into a new Commitee on Information, Computers and Communications. Gassman appeared to accept this approach, since he saw evidence of changes in the United States that confirmed the wisdom of this approach (188).

OST and COSATI

A million dollar cut in the funds of the Office of Education played havoc with the ERIC program. Two information analysis centers were being closed, one on the teaching of English and the other on adult and continuing education. The terminations brought a considerable unhappiness to the education and information communities. AEC, having less trouble financially, established a Nuclear Standards Library for old, new and proposed standards of the American Nuclear Society. NASA and AEC continued to cooperate with each other. NASA installed a RECON terminal making NASA information available electronically in its Germantown headquarters. The National Bureau of Standards, led by Dr. Lewis Branscomb, continued its aggressive information system building program by establishing information systems for building research, fire prevention and product safety. The National Standard Reference Data Program bill that received considerable OST support was signed by the President, giving NBS a two-year $6 million authorization for FYs 1970 and 1971. William T. Knox, whose status was always of interest to OST, left McGraw Hill Corporation to become the Director of NTIS in the Department of Commerce. Interaction between government and universities continued. For example, the Gypsy System at the Department of Interior's Water Resources Information Center (WRSIC) was being used to provide a retrieval capability from 22,000 items in the Selected Water Resources Abstracts data base to the University of Oklahoma. Melvin S. Day, who was such an important part of the COSATI endeavor, became the Head, Office of Science Information Service at NSF. At our suggestion, Dr. Cannon at the Department of Transportation appointed Dr. Alexander Hoshovsky, Air Force, to be the Director of Technical Information at that agency. On the negative side, the Library of Congress terminated the Pesticide Information Center because of the lack of funds. The National Agricultural Library agreed to take over some of this function. Additionally, because of a major reduction of funds and personnel at the Oak Ridge National Laboratory, the environmental science program, including an information component, was terminated, demonstrating the fragility of information programs were during this period. In assessing the value of COSATI, there was one indicator that appeared to have some validity. This was the number of persons buying COSATI documents. No extended effort was undertaken to keep tabs on the number of such documents sold by NTIS and the Superintendant of Documents, but we did have one example to point at, the COSATI Proceedings of the Forum on Federally Supported Information Analysis Centers. Out of 2,000 printed, only 250 were left. The COSATI Directory of Federally Supported Information Analysis Centers went out of print with 1,573 copies sold. A second printing of 2350 was made of which 2,200 were sold. A third printing was also ordered (188).
In a report of the President's first two years in office, two information initiatives were mentioned, the establishment of the new Office of Telecommunications and the Office of the Director of Communications for the Executive Branch. The stated purpose of the latter was
to provide better coordination for the overall information structure of the government, also to implement the policy of President Nixon, which was "to proclaim a philosophy of open government, to eliminate much of the secrecy which has plagued the credibility of government."
Considering the difficulties that the President ran into regarding the Watergate fiasco, this statement of principle clashed with events that followed. I do not think that the media were aware of it (188).

Another tidbit of history from the early 1970s. The Department of Labor and the Civil Service Commission joined hands to start up a hands-on computer training program for government workers, GS-1 to GS-5, using a third-generation UNIVAC computer in the basement of the CSC building. Many thousands of Federal employees were taught how to use computers as a result of this and other government training programs in subsequent years. Many of these and other government computer-trained workers migrated to industry in the 1960s and 1970s, a transfer of skills that has received very little attention (188). Higher pay rates were the magnets that precipitated the computer "brain-drain" during this period. I can recall that the problem for the military services was particularly difficult in those days, yet military recruiters were buying television advertisements that openly informed prospective volunteers of this attractive incentive. One of the COSATI projects that received acclaim was reported in the Chemical World-Index Key Newsletter, published by the highly respected William Wiswesser, an internationally known, entrepeneural expert in chemical notation systems. In his January 1971 issue of CWIK, he wrote (188):

Last month, the Executive Office of the President's Office of Science and Technology called a meeting of representative information managers in Federal agencies concerned with chemicals to discuss their information programs, interagency sharing of chemical information and data, and the need to work closely with non-go vernnment groups in developing a highly efficient national chemical information system...If this top-level Federal effort accomplishes nothing else in the next six years, we hope it finally will put an end to the costly computer clutter of those polysyllabic conglomerations in chemical nomenclature.

One of the bitter lessons we learned in the OST-COSATI effort to improve significantly the STI programs in and out of government was how much opposition and apathy, both entertwined, must be overcome to make even small gains. Improvements did not flow directly from new information technology tools. High voltage political pressure appeared to be needed to achieve institutional change. This was demonstrated so effectively by Hubert H. Humphrey in Congress. Inspired and tough-minded leadership, supported by resources, could make a difference by forcing progressive actions by individuals and groups not disposed to abandon less efficient programs and often power. In the face of relentless pressures and obstacles, it was difficult to maintain a positive attitude. The problem was not unique to the STI world, education was another tough nut to crack. The Commissioner of Education in the late 1960s, James Allen, proposed the Right to Read for every school child as a national target for the 1970s, the educational equivalent of the moonshot. He saw the problem of dropping reading scores in a number of big cities. While reading achievement over the long term (20-30 years) appeared to be improving, what once passed for a definition of literacy -- a fifth-grade education -- was proving inadequate to the bureaucratic needs of modern times. A writer in the Knowledge Industry Report reported that a recent survey conducted by Louis Harris Associates revealed that there are anywhere from 4 to 18 million Americans who have trouble filling out drivers'licenses or Medicaid applications because of poor reading. If stronger action had been taken during the 1970s to raise the national literacy level, we might not be crying, as many are, about the same problem in the last half of the 1980s. As in the education field, had we more seriously attacked science communication problems in the last decade and a half, we might have been

able to avert the feared loss of scientific and technological leadership that worries us today (189).

(189) Knowledge Industry Report, White Plains, New York, Volume 4, No. 17, January 31, 1971, Article: Is the Alphabet Made of Gold, etc. p 1.

David Z. Beckler continued to search for a formula that would make the preparation of the annual progress report on national science and technology meaningful and acceptible. Although I was not originally invited to make a contribution, I persisted in trying to convince Dave Beckler that his product would be incomplete without it. In mid-January 1971, I prepared a new outline of a chapter or section and submitted it to him. Some of the material is summarized below (190):

(190) Aines Andrew A., Outline of Proposed Chapter, Subject: Communications, Computers and Scientific and Technical Information, Presented to David Z. Beckler, OST Assistant Director, January 14, 1971, pp 5.

The chapter started with a Peter Drucker quotation: "Knowledge during the last few decades has become the central capital, the cost center, and the crucial resource of the economy." It was followed by an Introduction, a general statement of forces at work and their significance. Four points were made in this section:

A. The information and communication fields were now a growing force in our economy with a major impact on our culture and institutions, as indicated by: expanding computer and communications capabilities, the growth of the knowledge industry, and the reality of the post-industrial, information-rich society.

B. Emerging national information problems and priorities were receiving the attention of the Federal government and the private sector. Some of these were: interdisciplinary issues and programs, interagency and cross-agency programs, communication and sharing of information resources, and the creation of new Federal agencies, which needed full-grown information programs immediately.

C. The impact of many new and conflicting problems on society called for greater flexibility and skill in rapidly marshalling information resources, which brought such problems as: accessing, coordination, sharing, employment of new information technologies, rapid standardization, systems development, and better utilization of available knowledge.

D. There is a world-wide thirst for information and a clamor for membership in the modern information-possessing and information-handling club by all countries, large and small.

The next section dealt with Issues, Problem Areas and Dilemmas that needed priority attention. Among these requirements were: the need for national policies, better use of existing information resources to attack major national problems, the need to more systematically combine information,

data processing and communications resources, and the requirement for much improved management and dissemination of information.

The third section dealt with a number of other trends and developments, such as: the effect of continued computer growth and sophistication, as well as the results of R&D in information sciences technology; the increase in the number of national networks and special-area information systems; major new achievements in telecommunications; the internationalization of information systems and programs: the requirement for increased screening and compaction of data; the requirement for greater gains in technology utilization and assessment; and the continuing interest of and the expected pressures from the Congress.

The fourth section would include Projections and Potential Impact on Society Resulting from New Information and Communications Technology and Systems. Listed for treatment were continued expansion and impact of the Information Age: changing patterns of education and community life; the computer as a tool for individual users; continued government support for information services: a new thrust for better intergovernmental information systems at all levels; competition for control of information resources and apparatuses; increasing international cooperation; and development of rational Federal information programs and policies, improved sharing between the Executive and Legislative Branches, furtherance of the "responsible agency" concept, and the thrust for substantially strengthened information management and management information programs.

The fifth and final section would be devoted to overall and specific policy needs and a statement dealing with the need for coordinated, cooperative efforts.

A prototype chapter was written, using the above outline. But like the entire report, it never saw the light of the day, at least during the time that I was in OST. However, the material prepared will have future value, even in this book, where some of the material was used in the last chapter.
NOTE; RESURECT THE OUTLINE AND PROTOTYPE CHAPTER FOR USE WHEN WRITING THE LAST CHAPTER.
One of the curious episodes that took place in the Executive Office of the President involved the Office of Telecommunication Policy and the National Academy of Sciences. As mentioned previously, OST had been fairly successful in its interaction with OTP and did all that it could to keep OTP informed and involved of OST and COSATI activities, even to the extent of inviting OTP to send an observer to all of the COSATI meetings. For reasons that were not clear, OTP asked the National Academy of Sciences to undertake a Seminar on Information-Handling. Obtaining an agenda, I found that the object of the seminar was to explore the widespread application of information handling technology and the need for a national policy. In addition, NAS was being asked to analyze the information efforts of the intelligence community and its need for new information policies. To some extent these were matters that OST had been studying for several years. I felt that OTP should have been more diplomatic by inviting Dr. David to attend, since he had been involved in an earlier discussion with OTP that spawned the NAS seminar initiative. I reported

what was going on to the Science Adviser, and attached an agenda of the proposed meeting together with a copy of a presentation I had made to the National Academy of Science Computer Technology Panel six months earlier. The gist of my comments at that time were: OST is the top level science and technology policy group in the White House and here are some of the functions and programs for which it is responsible:

Coordination of Federal STI programs through FCST and COSATI. To one extent or another, I had explained that we were involved with COMSAT, Earth Resource Satellite Data, environmental quality data programs, computers for higher education, Federal computer educational and training programs, science communication programs, national and international information systems, and many more. These were some of the priority items we were recommending: problem-solving computer and communications programs; solution of legal problems resulting from new information technology and its use; improved education and training; integration of all major information-communications systems through OECD; providing world leadership in developing codes, standards, compatibility, convertibility, and data-sharing; determining and encouraging R&D needs, developing networks and databanking; establishment of an annual data plan for all data-handling organizations; and several more.

A day or two later, my memorandum was returned by Dr. David with this inked note: "Andy, no objections to your ambitious interests. We will never satisfy all of them!"(191) I found myself somewhat mystified by his comment, since the business at hand dealt with OTP-OST relationships. As hard as I was trying to communicate, I wondered, on occasion, if I was really getting through to the OST Director. This mystified me, since Dr. David, more than his two predecessors, reacted more specifically to the material in my weekly reports, a turn that I appreciated.

(191) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: NAS Seminar on Information Handling, (Agenda attached), January 19, 1971, 1 page. (also attached: Comments to NAS Computer Technology Panel, made by Andrew A. Aines, July 9, 1970, pp 4.)

(192) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, OST Director, Subject: Some Highlights of the Week, January 23, 1971, pp 4.

(193) Aines Andrew A., OST, Presentation to the Workshop Organized by the Agency for International Development, Battelle Memorial, and the Organization for American States, Subject: Information - A New Era Dawning?, January 18, 1971, pp 14.

Melvin S. Day, whose name and contributions appear often in this book, replaced Dr. Burton Adkinson as the Head, Office of Science Information Services, National Science Foundation. In Adkinson's retirement from NSF, the science communication community, in and out of the government, lost one of its pioneering stalwarts, whose Federal and national contributions were simply unmeasurable. It was fitting that his replacement, Melvin S. Day, Director of the NASA Scientific and Technical Information Program, another pioneer of the highest quality, should be his replacement, but it concerned me that the NASA STI program would suffer because of the loss. The Department of Transportation for the first time was providing COSATI with a very knowledgeable and conscientious representative, Dr. Alexander Hoshovsky. This made Burt Adkinson's loss a little less painful, at least, where COSATI was concerned (192).

At a meeting of COSATI held in mid-January, the Post Office representative, Mr. Maimon, announced that his organization was contemplating turning its 30,000 local post offices into information

centers. It was not clear as to what new sources of information were being contemplated in addition to postal information, but as we were aware, it had been customary for years for local post offices to provide other information services, not excluding information about the public enemies wanted by the FBI and, of course, provision of income tax forms.

At the same meeting, Harold S. (Ted) Trimmer, Assistant Commissioner, GSA, and James E. Gibson, Director of the National Audio-Visual Center, GSA, discussed the plans for the GSA Consumer Center and the National Audio-Visual Center. Both centers obtain Federal agency-generated information and make a central sales distribution. The GSA consumer centers were making data available about the performance of products purchased by the Federal government. What came through was the fact that while these were central functions not all of the information came through their facilities. The originating agencies, were in fact, still involved in some dissemination. At the time of the presentation, there were already 25 Federal Information Centers in major cities with 12 more planned, a considerable operation. Contemplating the rapid growth of Federal information centers at the local level, I commented to Dr. David: "Somebody ought to keep his eye on all of these programs to avoid duplication and overlap, such as exists between the Superintendant of Documents and the National Technical Information Service, lest the Federal government finds itself hip deep in local information centers." (192)

At a time when CD-ROM technology seems to sweeping into wide use by the information community, it might be noted that similarly in earlier years, we went through the Computer Output Microfilm COM) mini-revolution. Early in 1971, as an example of the latter, the Defense Documentation Center created a compendium covering its entire holdings of scientific and technical reports. It was a data package that made it possible folr users to have full reference of a ten-year segment of the documentation of the DOD R&D effort. COM coupled the storage and retrieval capabilities of the computer with high-speed photocomposition. The COM file was made available on 16 mm film and sold for $440. Of course, the CD-ROM technology permits a much greater storage and retrieval capability than the COM technology, but, at a time of rapid technological change, we can be certain that the revolutionary CD-ROM technology will give way to a more advanced storage and retrieval technology in a few years.

During the 1971 period, again we had to report that DHEW's Dr. Roger Egeberg was still having difficulty in appointing an agency coordinator for STI. STI programs continued to proliferate in that agency; one estimate of STI costs in that agency alone was more than $100 million a year. At the time, we were making an inventory of Federal agency STI program expenditures and DHEW was having difficulty in providing any useful data. Dr. David's support of the project turned out to be very helpful and for this he should be commended. Hu Loweth and Bob Howard of OMB also were supportive of the venture.

International

One of the throoughly professional efforts that COSATI undertook was the work of the Panel on International Information Affairs, then under the leadership of Melvin S. Day (Chairman) and Eugene Pronko (Executive Secretary). Their success in stimulating the professional publishing societies to work more closely with the Federal agencies on international STI activities was unique and appreciated on both sides. They also undertook the task of working more closely with the science attaches of the Department of State whose interests in intergovernmental STI exchange.

It was during this period that we asked Melvin S. Day to form a small ad hoc group to appraise and discuss the UNISIST program, prior to the major meeting of ICSU-UNESCO later in the year (192).

It was always a pleasure to see one of our COSATI plans reult in action. The first group of Latin Americans had come to Washington to participate in the OAS-AID-Battelle program on January 18, 1971. I was invited to make an opening presentation, which I named: Information-A New Era Dawning? Here are a few thoughts culled from the statement:

Most of the literate world, without fuss or fanfare, have moved from a condition of information scarcity to information abundance.The shift from the inkprint (Gutenburg) era to the electronic information era is creating a discontinuity of as yet unexplored dimensions. It may take a few generations before we know what the score really is, but we already see that a new day is dawning. There is an information explosion. The half-life of technical knowledge gets shorter and shorter as the thrust for greater production and harvesting of knowledge of all kinds increases. The economics of science publishing is getting out of hand. Data proliferation, a given, as we move into the era of electronic information handling, has already been called a new form of pollution. The daily production of computer print-outs in the three states of New York, New Jersey and Connecticut exceeds all of the printed matter being produced in those states. Only a few miles from this chamber, NASA is storing more than 200,000 reels of data telemetered from satellites. Leaders in each country are now recognizing that the hitherto random and unorganized information processes are now being institutionalized and interconnected. We are beginning to talk about the possible need for national information systems for science and technology. As we move in this direction, it becomes obvious that we are rapidly approaching extensive and expensive information systems that call for expert management. No universities that I am aware of prepare skilled information managers, unfortunately. It is a paradox that we should need vast quantities of new knowledge even while we are being drowned in the information and data that we produce, but that is what is happening. Every act, every aspiration, every thought, every need. every study, every program, e ery attack or defense of the status quo, every change - these generate and require a base of knowledge. In government, in industry, in commerce, in agriculture, and in education the information and data needed to advance knowledge, solve problems, and make decisions is exploding. Our Congress for the first time in history has decided to computerize its information and data-handling processes. Traditional clerical methods are losing their utility, a process that is probably irreversible. There is a new information era dawning with exciting prospects ahead for all nations, regardless of their wealth, size and stage of development. There is a huge bank of knowledge built up over the history of man, which is ready for withdrawals and deposits. As a matter of policy, the United States believes in open dissemination and broad exchange of scientific and technical information, and we have built our system and created facilities to support this view. You will see some of these during the time you are here. I wish you a most fruitful stay, and invite you to return many times in the future (193).

(194) White House, The President's Proposed Restructuring of the Executive Branch, January 22, 1971, pp 4.

In the President's State of the Union Message of 1971, there was a statement that indicated that it was his intention to reorganize the Executive Branch by establishing four new Executive Office departments:

natural resources, human resources, economic development, and community development. The Departments of Interior, Agriculture, Commerce, Labor, HEW, HUD and Transportation were to be absorbed into the new departments along with various, independent agencies. As information experts would quickly recognize, such a series of actions, intended to streamline the Executive Branch, would result in considerable changes in information programs and practices. Unfortunately for the President, the reorganization called for new legislation. Insofar as the members of Congress were concerned, the proposed changes would dramatically upset the structure of committee responsibilities that had grown over the years. This was too much for the Congress and the President's restructuring gambit was stillborn. For the first time, perhaps from a worm's eye perspective, I began to understand how a proposed shift in organizational structure can be inhibited by suspected changes in the distribution of power and upheaval in the information culture in place (194). Thinking about this manifestation, linking power structure and information culture, resulted in my writing a note to Dr. David on the State of the Union Message (195):

(195) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director OST, Subject: Intelligence and Commentary -The State of the Union Message and an Essayette on Knowledge, Power and Control, January 25, 1971, pp 4.
 While the President's State of the Union message contained little about science, technology and information, almost every line uttered had some message for those who are involved in the creation and handling of information banks and systems. For example, the reorganization of government agencies into new combinations will change the patterns of information exchange and control. The new Secretaries will find it necesary to take control of management, STI and other information programs right at the start or they might find the full control of their establishments somehow remains in the hands of their subordinates. It is my thesis that one of the reasons for the insensitivity of agencies to adapt to new challenges has deep roots in internal and external communications and information-handling practices. I advocate that each of the groupments, if they are enacted into the law, create a new post dealing with communications (not public information) located in his front office. I find it extraordinary in this day and age that agency secretaries have not moved in this direction to ensure their control. Human nature being what it is, it is understandable that subordinates in multi-element agemcies are not enthusiastic when structural change threatens their monopoly over information. I have witnessed this phenomenon in the Department of Defense, the Department of Interior, and other governmental organizations. It is probably a universal condition (195).

Professional Societies

The newest group to experiment with an interactive search and retrieval system was the American Psychological Assoc iation, the professional society that received considerable NSF support. The organization announced that it would make its Psychological Abstracts tapes available to psychologists in the Washington, D.C. area for a 6-months trial period and to libraries and other groups in the future. APA thus joined Chemical Abstracts and other services in a fast-growing development that was creating a national and international movement. Similar products are being prepared by government and private sector groups. Merged bibliographic magnetic tapes were becoming marketable, especially for selective

dissemination services. Attempts are being made during this period by primary and secondary publication managers to share abstracts and other information products who were seeking to reduce costs. Interestingly, Bill McElroy, Director of NSF, had written to APA asking for cases of payoff from basic scientific research. He wrote:

The Federal investment in scientific research must continuously and properly be justified. We need assistance in identifying how basic research has contributed to he solution of problems facing society, how such research has produced the knowledge by which man has improved his condition, and new knowledge of himself and his surroundings has enabled man to learn to live more productively.

I added a comment:

This is interesting. The kind of question that was asked in the past was more like: Do you have a project that you believe will create significant new knowledge? McElroy is inferring that in the future funds for research will be metered out in proportion to documented proof that there is a payoff to society. Applause!(195)

One of the criticisms of American industry, which has lost so much ground to Japanese and other exporters in recent years, is that it neglects the consumer. This reality is influencing governmental organizations, such as GSA, to create interface organizations facing the public. Robert Sarnoff said in a recent speech, reported in the Washington Post:

This is the age of the articulate consumer (who) is demanding a more active voice in determining the nature and quality of things available to him. Business will have to spend less time talking and more time listening and responding to what it hears. Every company that has not already done so will find it necessary to establsh an effective mechanism for two-way communication with buyers and users of its products.

Reflecting on this observation, I wrote:

The new electronic information media should facilitate the flow of better and faster information, which, in turn, changes the recipient, who can then become more discerning and selective. The interactivity of the new media will thus potentially strengthen the consumer, who may be more able to resist customary one-way manipulation. In the meantime, I expect that we will achieve a real breakthrough in government operations and hopefully in the solution of complex societal problems when the people in charge better understand the new communications and act accordingly.

Responding, Dr. David wondered how the Executive Branch might use the technique for opinion-gathering. This, I found to be an interesting question, largely because of my belief that most of the top Federal executives I knew were not overly sophisticated in the use, power and promise of new information technology. Moreover, they were not even prone to engage in even simple face-to-face communications with employees below the fist tier of the nearby executives close to them. With this kind of philosophy and insulation, I did not expect them to reform simply because new information technology could play a facilitating role in opinion-gathering. I concluded that the Executive Branch top executives would use the technique only if their job sheets required that they do so and they were graded for performance by their superiors (195). I also concluded that communicators were not necessarily good managers, even though they graded high on communications skills. My skimpy evidence was a Washington Post article (January 21, 1971) that reported that the National Communications Club in Washington folded only after being open for 74 days. Of the 16,000 people who worked in the Washington area in the

communications field, 1,076 joined the club. The members, it turned out, owed about $137,000 in dues, while the club owed its creditors $100,000. An interesting, but non-lethal exchange of views took place between Dr. David and me late in January 1971. It started out with my unsolicited review of the information aspects of the OST Task Force on Earthquake Hazard Reduction, issued in November 1970. While the report radiated the need for considerable information and data gathering, it made little or no mention of these needs. This lack I found resonant in a number of earlier OST reports and I wanted to get this through thought across to the Science Advisor. Dr. David confirmed this in his inked comment. He wrote, "Same is true for environmental area, also health, education, and so on."

The second paragraph in my comment, referring to the earthquake report went on:

My appraisal revealed that the Task Force felt that new information and data are needed; that updating of older information banks is necessary; that more sophisticated information systems are required to store, retrieve and disseminate information more rapidly; and in a general way, the data foundation for the community is backward and underdeveloped. My appraisal also convinced me that nobody was really working on a general plan to improve the situation and that no real mechanism exists to engineer needed remedies.

I acknowledged that:

Improvements will come slow, hard and piecemeal. It will be hard to find the funds and strategists to create a modern system for data-handling for hazard reduction related to earthquakes. It will be hard to get follow-through, but perhaps through FCST or some other organization somebody could ride herd on the information aspects of the report and provide a report on progress to the Science Advisor within nine months. I suggest the same treatment for other OST and FCST reports.

Instead of saying that this course of action seemed reasonable and the reports would be strengthened if data requirements were considered, Dr. David responded:

I wonder if the technology to do the job really exists. I am thinking about shortcomings in software, reliability, privacy, access control, and backup.

This statement struck me as being something less than fully responsive, since the information technology of that period was fully adequate to accomplish what I was recommending, i.e., the inclusion in each report of a data section that would make the report more complete and the recommendations more implementable. The fact of the matter was that, aside from OST, more and more major technical reports were giving coverage to information needs and strategies to obtain them. I am sure that if Dr. David and I had a chance to discuss the matter, rather than exchange notes, he would have agreed with my view. This problem results, I believe, because it is traditional for scientists to use data and statistics carefully in their research, but not to spend much time in writing about the data strategy they have used. This traditional approach may be perfectly satisfactory for small finite research packets, but the rules, it seems to me, change when large, complex, societal problems, like environmental quality or education, draw attention. On the other hand, it was fairly evident to the OST staff that Dr. David was a highly intelligent and articulate scientist. There were a number of examples of his sagacity. On one occasion, he received a letter from Dr. Ruth M. Davis, Director of the Center for Computer Sciences and Technology,

dealing with the assessment of the utility and the technology of ultraminiaturized storage and retrieval systems, a problem confronting the Federal agencies for some years. Dr. Davis, in particular, lauded the research of Dr. Fernandez-Moran, who she described as a "brilliant electron-microscopist" at the Fermi Institute (196). Dr. Davis wrote:
Dr. Cummings, Director of NLM, and I felt it important to address this problem and did so through discussions with scientists, information system managers, and lastly a visit to Dr. Fernandez-Moran's laboratory in Chicago. I am enclosing a brief discussion of the problems of ultraminiaturization systems and a recommendation for action to be taken by Dr. Cummings and myself on behalf of the interests of federal agencies. I am asking you for your concurrence in our action and for permission for me to work with one of the physical scientists on your staff to keep you advised of our progress.
Dr. David responded as follows (197):
Information storage and retrieval is, of course, a field of great importance and broad application. The trend however today appears to be toward storing information in coded or machine-readable form for recovery and processing by machine. The proportion of information which needs to be stored in the form of imagery is apparently decreasing. Extreme miniaturization in the storage of imagery can probably not be supported on a cost savings basis. The present state of the art of miniaturized storage of imagery has reduced the cost of storage to an extent that the major cost is in the handling, organizing, and retrieval rather than in the capital costs associated with bulk storage. There would seem to be little or benefit to an intensive pursuit of further miniaturization of imagery.
In light of the events of the intervening years, Dr. David's views were prophetic. Micromedia are still in use, perhaps technically better than in 1971, but the era of CD-ROM is in full swing.
(196) Davis, Ruth M., Director, Center for Computer Sciences and Technology, National Bureau of Standards, Letter to Dr. Edward E. David, Jr., Director, OST, Subject dealt with assessment of ultraminiaturized storage and retrieval systems for use by Federal agencies, undated, but written on or about the first week of January 1971, 1 page.
(197) David, Edward E., Jr. Director, OST, Response to Dr. Davis' letter, January 28, 1971, l page.
(198) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Weekly Summary, January 29, 1971, pp 5.
Federal R&D Project Reporting
There were occasions when I felt that OST often resembled an information supermarket. Businessmen interested in selling U.S. government information probably have a long history, starting with the establishment of the republic. I can recall the visit of C.Boyd Johnson and Lawrence Mickelson, Economics and Management Division, Midwest Research Institute in early 1971. They were interested in the utilization of government documentation related to current R&D projects of the Federal governement, such as shown on the DOD Form 1498. It was their view that the dissemination of this kind of information would be of significant value to small businessmen. They divulged the fact that they had approached individual Federal agencies for the project data and had received unenthusiastic responses. Several years earlier, when I was still involved in Army R&D, I had suggested that it would be a simple matter in preparing project data to include in the Army counterpart of DOD Form 1498, and later in the Form 1498 itself, an additional datum that would be entered by the officer or

scientist responsible for the project. This would mark the project as having technology transfer potential. This would make searching the entire current file of DOD R&D projects for those in this category relatively simple. Therefore, when Johnson and Mickelson talked about their interest in marketing Federal project reporting data, I was sympathetic. I admit that I was less sympathetic with the Federal R&D program authorities, who seemingly preferred to withhold these data. I still feel that a much better project reporting system is desirable, even if it were focused solely on reducing the possibility of duplication and overlap of Federal R&D projects (109)

OMB

To many people in and out of the government, the Office of Management and Budget evokes an image of power incarnate, and, for the most part, this image is accurate. But to those who work closely with OMB, and I venture the view that to some individuals who work within OMB, it appears less powerful and knowledgeable. One basic reason is OMB's long standing policy to play down claims of its power, especially where touchy cabinet officers who have entry to the President are concerned. For the most part, I found working with OMB personnel pleasurable, but every now and then an individual would come along, who did not fit this pattern. It should be understood that OST, which had no legislative status during its lifetime unlike OSTP, lacked authority to direct action on the part of any individual or group in the government. OMB, on the other hand, does influence government agency budgets and policies, through persuasion, circulars and other documentation. We were fully aware in OST that when we needed more clout, a few carefully chosen words from OMB to a non-cooperating Federal agency could, on occasion, turn things around. During a discussion with one OMB official, he complained that in his view there were an excessive number of individual Federal workers on COSATI panels and task groups, but he was unable to state what a reasonable number should be. Every task COSATI undertook was done with the support of the Federal agencies, a sign that they were not concerned about the size of the COSATI effort. I countered with a plea that OMB should help OST by pressuring the agencies to provide more competent individuals who could get a COSATI task done more quickly and efficiently. When I told him that it was frustrating at times because there was so little understanding in some OMB quarters about the dramatic, new demands on Federal information management to formulate and improve all information policies and practices. When I pointed out that it was often necessary to interact with many OMB persons on information matters, largely because there was not a single individual in OMB acting as an information focal point, he asserted the view that it would be hard to find anybody in OMB who could play this role and besides, this would not change anything materially. On another tack, when I suggested that it would be profitable, if OMB could bring the OMB persons who were involved in various information policy formulation and action programs together with OST to discuss the changing size and gravity of the information problems and challenges, this gentleman disagreed until I told him that his superior had already agreed that this was a meritorious approach. He quickly changed his tack. Many years passed before OMB created its current Office of Information and Regulatory Affairs to reduce paperwork and incidently to take a broader view of Federal information problems and needs. OMB has still not gone as far as it should to look at the big picture nor has it done much, at least openly, to coordinate all OMB information program activities (198).

International
Environmental Quality
Because this era was one that encouraged the internationalization of unclassified STI programs, I heartily concurred with a request from Dr. John Buckley, OST's environmental quality activities coordinator, and prepared the "United States Proposal for an ECE Program to Facilitiate and Coordinate the Exchange of Environmental Data and Information." It contained guidance notes for the U.S. representative to ECE, Christian Herter, background material, and specific actions that ECE might undertake (198). The authority and top-level support needed to establish an aggressive international STI development program were simply not in the cards.

Yet the eagerness of other countries to work more closely with the United States did not diminish. After the first OAS-IAD-Battelle Memorial workshop on STI was successfully completed, I was visited by Dr. Guillermo Fernandez, an attendee and leader of the Mexican government STI program. After a broad discussion with him on the U.S. and Mexican STI programs, it seemed like a good idea to arrange a technical information meeting with Mexico along the lines of the sessions we were holding with Canadian officials. We agreed that if our governments approved we would try to create future round-robin meetings that would include the United States, Mexico and Canada (198). I received no response on this possibility from the OST front office, which I found disappointing.The notion of following up with Senor Fernandez on the U.S.-Mexican initiative was reluctantly dropped; perhaps I should have been more aggressive.

General Accounting Office
A fascinating interaction took place with Edward Messinger of GAO, who informed me that he was preparing a study for Elmer Staats on government printing practices. Messinger reported that when he began to look into the subject he found some strange things. First, he found out that GPO, a legislative function, was carrying out an Executive Department function, since only 15 percent of its printing was related to Congress. Second, it had a warehouse full of reports that dated back 30 to 40 years, taking up space badly needed for other purposes and unable by law to discard them. Third, he found a "czar-like" figure, Jack Haley, Director of the Joint Committee on Printing staff, running the show for all of government while remainin a member of the Typographers Union. Fourth, at GPO the printers still regarded offset printing, which was typically used commercially, as unconventional. He observed that GPO was buying linotape equipment, stripping away the tape part so that traditional "one finger" typing had to be used. Fifth, he found that no inventories of reports or job routings were kept. Sixth, the Federal agencies had all kinds of additional printing distribution programs, but GPO steadfastly refused to interact with them. Seventh, a pricing system was used by GPO that penalizes the Federal agencies and favored faster and better work for congressional groups. Eighth, Messinger found that the GPO union problem was bad, especially in connection with the stewardship of Jack Haley. He made the observation that that GAO wanted to look at the total picture rather than studying what was going on within each agency, but he was not sure if Haley had enough congressional power to squelch what he considered a very necessary study. He found the COSATI (Downie) study on Federal dissemination splendid, an "eye-opener," but he did not tell me how he had gotten a copy of the report, which had just been made available to FCST and not yet been publicly disseminated (198). This information has not

been made publicly available since I reported it to Dr. David in 1971, but it is now time to let the record show that it happened. On another GPO matter, the prestigious Special Libraries Association, which maintained a special government information activities committee, expressed its unhappiness that GPO was contemplating using a new microfiche reduction ratio different from the COSATI standard that the Federal agencies were all using. GAO was not confining its efforts to GPO at this time. It had its own problems of coordination. Bill Knox, the new Director of NTIS informed me that there was a two-man team from GAO making a three-month study of his operation. This team was augmented with two higher level GAO officials who were working part-time on the review. Two weeks later, another GAO team came to NTIS to make a study; neither of them were aware of the other's intentions (198). I heard no more about the GAO study of the GPO program thereafter and assumed that Jack Haley had triumphed again, but the views of Ed Messinger were not forgotten over the years. He convinced me that a long, hard look at the JCP and the GPO programs was needed when the climate was more favorable.

OST

Thrugh an outside channel, word continued to drift to me that Dr. David was holding periodic luncheon meetings with a group of government officials involved with information, computing and communications. I took the bull by the horns, so to speak, and wrote to him: "From time to time, I note that you have meetings with computer and other associated information-communications people. To be able to follow through for you, do you have any objections if I ask to attend some of these meetings as your staff official? Discretion guaranteed (198). I received no response whatsoever from Dr. David and could not resist comparing his secretiveness and his "different" management style with those of his predecessors. Since he was always pleasant and cordial when we met, the suspicion that he was not fully behind the OST and COSATI STI programs began to grow.

International

  (199) Department of Economic and Social Affairs, United Nations, The Application of Computer Technology for Development, January 1971, pp 122, plus 9 annexes.

During the late 1960s, a number of actions were undertaken by the United Nations' Secretary-General to ensure that the U.N. would play a more dynamic role in the development and diffusion of computers, communications and information. To describe its actions, the U.N. issued a series of publications. One was The Application of Computer Technology for Development, consisting of three major sections: an introduction, a brief description of computers and an executive summary. Part I covered programs for developing countries and Part II listed and discussed caveats, barriers and incentives.

Recommended were the following actions:

Training and education to apply computers to accelerate the process of economic and social development as first priority; establishment/or strengthening of appropriate centers at national and regional levels; establishment of better means for exchange of technical information; preparation of a broad national policy consistent with national goals and set aside of sufficient resources; establishment of an international advisory board on the application of computer technology for development; improvement of management decision-making and resource allocation; and others.

One useful section of the publication was a description of the United
Nations family of organizations involved with computer technology for
development. Mentioned were the following programs:
The United Nations Industrial Development Organization (UNIDO)
The International Labour Organization (ILO)
The U.N. Educational, Scientific and Cultural Organization (UNESCO)
The World Health Organization (WHO)
The World Meterological Organizatgion (WMO)
The U.N. Development Program (UNDP)
The International Bank for Reconstruction and Development (IBRD)
The U.N. Institute for Training and Research (UNITAR)
The Food and Agriculture Organization of the U.N. (FAO)
The International Communications Union (ITGO)
The Internaional Atomic Energy Agency (IAEA)
Also mentioned and described was the Intergovernmental Bureau for
Informatics - International Computation Center (IBI-ICC), which was
created under the auspics of UNESCO starting in 1946, but finally coming
into being in 1961 in Rome, Italy. Three other organizations are
described; the International Federation for Information Processing (IFIP),
the International Federation for Automatic Control (IFAC), and
Intergovernmental Council for Administrative Data rocessing (ICA). The
last four have an association with the United Nations family of
organizations, but they are not strictly components of U.N. (199).
There is no doubt but that the Information Age has had a galvanizing
effect, not only on information system development in countries, but also
on international organizations. Older international bodies were quick to
jump on the information band wagon. Newer ones were formed because of the
changed information and communications needs. It was also evident that
there was a considerable amount of overlap and duplication in these
organizations as each jostled for a new or more secure position in
whatever hierarchy they existed. This has been most evident in the affairs
of the United Nations and its siblings. During the period that UNESCO was
creating the UNISIST program in the 1960s, it was very evident that the
competition was direct and often acrimonious. The status of IBI-ICC has
been vexing, since it and other U.N. entities have sought the mantle of
chief gladiator for the information-minded developing countries.
(200) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director,
OST, Subject: Intelligence-Summary, February 1, 1971, pp 6.
Congress
One of the subjects that I found fascinating was the congressional effort
to legislate safeguards against the invasion of the privacy of
individuals. There was no doubt about it. The thrust towards electronic
information systems made it much more possible to maintain dossiers on
individuals. On the other hand, it was evident that there would be gains
for society, which would be able with the new technology to develop
indicators of value to society. It seemed to me that the new information
capability, in making it harder for individuals to commit crimes and other
offenses against society, was making a valuable contribution. People who
obeyed the laws would have nothing new to worry about. Even so, there was
considerable fear on the part of responsible individuals that the state
was being given new and potentially dangerous power, a significant shift
in the relationship between the government and individuals. As an
information person, my interests were less on who gained or lost in this
contest and more on the arrival of a major issue in the Information Age,

an issue that embraced attainment of information equilibrium during a period of change. Freedom of Information was, of course, another major issue in the same ballpark. As the COSATI Panel on Legal Aspects of Information Systems had delved into privacy, freedom of information, intellectual property and other legal issues earlier, I enjoyed considerable interaction with the excellent public-spirited lawyers who made up the panel. Many hours of conversation had led me to deeper interest in the field of law and how changes would have to be made to cushion the imnpact of new information technology. It was during this period that Senator Sam Erwin's Subcommittee on Constitutional Rights, Committee on the Judiciary, was holding hearings on databanks and the possible invasion of privacy. It was quite evident that the subject caught the fancy of many people who were afraid of the possibility of the loss of privacy and therefore antagonistic to the growth of databases. In reporting to Dr. David, I wrote:

I have one minor objection to the show that will be put on by the Senate Subcommittee. We can expect that short shrift will be given to the undeniable probability that databases could provide an unusually bright light to bring order out of the chaos that stamps human affairs today. I agree that the anti-individual and anti-social potential of computerized databanks must be kept under control at the same time (200).

In the same report, I addressed another subject that was receiving little or no attention. It started with a comment about a current debate raging in France dealing with state-controlled television. Under Charles DeGaulle, opposition spokesmen were excluded from the television screen, except on the eve of presidential elections. The power over the use of the "tube" vested in an in-group was evident even in municipal problems, making the excluded politicians furious. I then shifted to American television and its objectivity, which was then being challenged by the American Vice-President Spiro Agnew and others. After this opening, I pointed out that much of our science communications takes place in scientific and technical publications and between scientists in symposia, meetings and in personal communications. Other information dealing with science and technology is disseminated by the media on an increasing basis as science and technology continue to expand. The decision to disseminate this information is traditional responsibility of those who have control of what is printed or electronically conveyed. I then focused on the one suggestion that I wanted to make, i.e., the need for a dedicated television channel or channels for scientists and engineers, a channel that would be under their own control. Such a channel could be used for announcements of breakthroughs, interaction between R&D funders and grantees, notices of employment opportunities, discussion of problems and issues of general interest, education and training, etc. The conduit would not be used for propaganda or self-serving purposes. I was hoping that this suggestion would stimulate action of a dialogue with the Science Advisor, pro or con, but the suggestion was met with silence (200).

Another comment dealt with the departure of the faithful old linotype, the grand old reliable of the printing industry, the hot metal-spitting typesetting machine invented by Ottmar Mergenthaler in 1884, which was, during the early 1970s, relegated to the kitchen-midden of printing and reproduction. During its hey-day, this invention had revolutionized the printing industry, making the development of large-scale mass circulation newspapers possible. It disappeared as did the newsreels from the moving picture houses when television was developed and popularized. The linotype

was "done in" by newer computer-directed photographic and electronic printing equipment, except in the Government Printing Office, where the union prevailed for a long time (200).

The public spirited FCC Commissioner, Nicholas Johnson, proposed that the "truth commercials or spots" successfully applied against cigarette-smoking "might be applied across a whole range of dangerous consumer products. He admitted that this was a long shot since FCC had ruled against groups seeking to put more "truth spots" into television programs. Johnson claimed that radio seems to have suddenly come of age since television took over its hackneyed situation comedy routines, its stand-up comics, and its weekly musicals. He found that radio is "shunting the special interests aside in order to get accurate and truthful information on products and their disasterous side effects" (200). In the late 1980s, there is no evidence that radio has significantly improved, nor that CATV, has purified commercial television. There is some evidence that the elimination of smoking advertisements from television may have reduced the smoking habit among older males (200)

Information Management

While much of the information effort during the early 1970s seemed to be directed to the procurement and use of computers, I continued to argue that there was an even stronger need for the government to inmprove its information- handling management capabilities as a high priority. The former head of BOB who had become the Comptroller General, Elmer B. Staats, confirmed my view with a statement to a Senate group. He said, "Nowhere in government is there a complete tabulation of the billions Washington spends to arm foreign nations." He went on to complain about the lack of reliable comprehensive facts available to him and members of Congress. He contended that accurate information was necessary to determine if the programs were under control since control was one index of effectiveness. Areas that required better information were listed as excess weapons donations, military property transfers, Food for Peace gifts and others, Picking up on this theme, I wrote to Dr. David:

I do not think that there is a plot by the agencies to avoid keeping records to thwart the need of Congress (and the Executive Office of the President) for data, but I would argue that the information-handling practices of the agencies are in need of tough-minded reconstruction. Our difficulty in obtaining obligations data about agency STI programs is a case in point. The agencies have had a decade to prepare themselves for better recording...We will never get the best out of our new communications and information-processing technology, unless we match them with new techniques, advanced systems and resolve to obtain requisite data and information (200).

Sensing that the current (1971) Science Advisor, who was recruited from the Bell Laboratories, as a result of his experience, was more interested and attuned to information technology development and less to the need for greatly improved use of the technology to heighten mission accomplishment, I wrote him about an OST-prepared Report to the President on Protecting the World Environment in Light of Population Increases (1970), a report which was endorsed by the President. I pointed out that I was conducting a continuing inquiry about inportant governmental studies, especially those conducted under OST aegis, to determine what information and data needs were identified in the reports and what should be done about them. Most of the recommendations called for new data progams or improvement of ongoing ones. They clearly revealed that the task of protecting the environment

required a stronger information foundation, if we wanted to succeed in this crusade. The report was replete with examples of where data were needed. Here are a few examples:

A developed country experience database of value to developing countries.
Inventories and soil maps of various parts of the world so that land use patterns can be optimized, especially in tropical, arid and semi-arid land areas.
Global environmental monitoring.
International air and quality standards and a data program to formulate the standards.
Network for forecasting weather and measuring inadvertent weather and climate modifidations.
Rate of exploitation of resources, accumulation of wastes, recycling of wastes into the production system and cost-effectiveness.
Effect of fertilizers, herbicides, and chemical fertilizers used in developing countries.
McGeorge Bundy was also quoted in the memorandum to Dr. David. Dr. Bundy made an address on environmental information to a conference on the management of information held by the House Committee on Science and Astronautics (January 27, 1970). Among other things he said was the following:

We cannot manage the environment effectively without knowing what it is, what it was, and what it can be. Not surprisingly, but most unfortunately, no agency is either assigned or assumes responsibility for conducting an overall ecological evaluation of the environment as a whole, nor is there any common interchangeable or comparable sampling method now in use, though the quality of the air, for example, quite clearly impinges on the quality of the water...A first requirement is to conceive and install a systematic and comprehensive system of ecological observation and data collection...(200).

The Quest for Better Data Programs
After all of these intervening years, the strong belief that the American government has not yet learned the skill of developing and operating effective and efficient mission scientific and technical information systems persists. During its salad days, COSATI put most of its effort into the improvement of bibliographic information services. It is probably fair to state that the agencies had responded well to the need for organization of their bibliographic. The respectability afforded to NTIS, DTIC, and similar programs in the Departments of Energy and the Atomic Energy Commission underscores this accomplishment. The problem was not as well solved in other Federal agencies engaged in ecology, environment, urban renewal, law enforcement, population control and the like.
Scientific and technical data, including statistics, were increasing in importance for these agencies. More and more, we were beginning to seek improvements in data acquisition, data handling, data screening, data analysis, data compaction, and data use. Interagency coordination was needed in this area. This sea-change was being noted in Congress. Examples cited by Charles Meadow included the announcement of the Dingell Bill for an Environmental Data System, the Congressional Reorganization Act, which was expected to lead to the way that agenices reported management-related data to Congress. Other data programs were listed in the studies made by Science Communications, Inc. and reported elsewhere in this book.
We had not succeeded in formulating a national policy on information dissemination or in a national information system for science and

technology. We began to see slippage in support of page charges within the agencies. The problem of user charges was becoming enlarged. Questions were being asked about such matters as: how much control individual agencies had over their own publications and their dissemination; the extent that agencies would continue to consider STI expenditures as a legitimate part of research and development investment; whether or not the Federal government should continue its support for the development of professional society technical information programs. These were well understood as highly important components of a national STI system. The American Chemical Society information program received 70 percent of its articles and subscriptions from overseas' sources. Physics was in the same boat. We knew that our relations with developing countries were "touchy," even though the U.S. was a major exporter of information, much of it sponsored by the Federal government, but we could do little to accelerate this program. Internally, we recognized that we had to make changes in the activities of COSATI. The Panel on Education and Training was losing some of its momentum, even though the need for education and training in STI matters was rising sharply within the Federal government. We could detect a lowered interest among FCST members for improved STI programs and projects, although it was explained that the problem of ennui extended into all R&D fields within and outside of the Federal government. Matters were not made easier because of key personnel changes with OST. The OST Deputy Director, Dr. Hubert Heffner, was replaced by a newcomer, Dr. John D. Baldeschwieler. The Executive Secretary of FCST, Eric Ward, was replaced by Dr. Lawrence A. Goldmuntz. my good friend and colleauge, Dr. Stephen Rossmassler, the COSATI Executive Secretary, returned to the National Bureau of Science. Charles T. Meadow took his place. I found it increasingly difficult to interest new OST arrivees in STI matters up to the same level as those who departed. Matters were not helped by the decreased level of interest in STI visible at the level of the Director of OST, an attitude that was transmitted consciously or unconsciously to his subordinates within OST. I resolved that I would press on and pay no visible heed to real or imagined obstacles.

(201) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Reconnaissance-Intelligence-Commentary, February 9, 1971, pp 4.

My interaction with Dr. David became more interesting. In early February 1971, I wrote him a note about a London seminar, Infotech Limited, one of a series devoted to computer issues. It was one of the conclusions of this seminar that while networks of computers linking many organizations could revolutionize world economies, this would not materialize "if the common carriers continued to provide data transmission services at their present slow rate. Instead private, incompatible networks would proliferate, even within single organizations, and successful investment in these would build up massive resistance to future rationalization." My comment disagreed that the only barrier was the rate of change of common carriers to provide faster services. I also "saw people, institutions, education, availability of resources, entrepreneurship and cultural patterns as major blocks." Dr. David pondered on this item and wrote, "It's the computers and terminals that are incompatible - not the networks." He was correct, as I saw it then, that there was need for the improved compatability of computers and terminals, but it struck me that he disregarded the human factors that I found so important (201).

(202) Aines, Andrew A., OST, Memorandum to Dr. Hubert Heffner, Deputy Director, OST, Subject: Budget Issues for Spring 1971 Planning Review, February 12, 1971, pp 3.

OST

Given an opportunity to participate in the OST Spring 1971 ing Review, I pulled my hobby-horses out of the barn and offered the following suggestions:

1. A general strengthening of all agency STI programs might result in substantial savings, conceivably as much as a billion dollars a year. Little new money for STI would be required for planning purposes. I contended that no Federal agency during this period had a completely sound STI program in place.

2. The concept and implementation of the recommendation calling for the establishment of reponsible agents deserved attention. I suggested that a $200,000 planning program be started. Two additional spaces for OST and COSATI were required to get this project started. The earlier FCST recommendation was four spaces.

3. Rapid development of a Federal Current Research and Development Databank, replacing the SSIE program, was recommended. No more than $200,000 would be needed to start action.

4. Consideration should be given to the merging of at least three Federal general purpose information activities: NTIS, SSIE, and the National Referral Center. NSF and Department of Commerce should be given consideration and authority to operate the new facility.

5. A study group should be formed to appraise the health of professional society publishing programs, including the page charge convention.

6. There should be an increase of funds for the National Standard Reference Data System, which was then operating at low speed at the National Bureau of Standards. About $10 million increase was a reasonable planning figure.

7. The untimely demise of the State Technical Services program has left a vacuum at Federal level and a number of vacua at State level. About $3 million should be restored to this valuable technology transfer project.

Other suggestions: much more efficient use of computers throughout the Federal government; a stronger program to maintain U.S. leadership in the teleprocessing arts and sciences so that this area does not go the say of consumer electronics (television, radio, etc.); modernization of the Patent Office's information-handling system; and increased support for agency information analysis centers to make up for the erosion that had taken place in the last few years (202).

As I expected, there was no grass roots movement in the front office of OST to support these recommendations, merit aside.

(203) Aines, Andrew A., OST, Memorandum for Dr. Edward E. David, Director OST, Subject: Review of the Preceding Week, February 13, 1971, pp 3.

OMB

I continued to seek ways of working more closely with OMB. Because of the Brooks Act, OMB had staff working on some aspects of computer procurement, standardization, and management information systems. The budget examiners, of course, were involved with all aspects of Federal agency programs, and, in that regard, also got into information programs. A third group was responsible for statistics and had responsibility to authorize Federal agencies to gather statistics and utilize forms for this purpose. The three groups did not work together in any perceptible manner. Individuals in Walter Haase's shop agreed that coordination within OMB was desirable. They did not see a likelihood of change because the priority of Haase was on management information systems with only the baresrt of interest on STI matters. This view was confirmed in a meeting with Lawrence Slaughter, OMB (203).

DHEW

My plea for improved coordination of all DHEW STI programs was answered in mid-February 1971 by Dr. Roger Egeberg, the DHEW representative to FCST. Dr. Martin Cummings was chosen for this role with the assistance of Donna Spiegler of Dr. Egeberg's office. At the same meeting, which took place at NLM, it was announced that DHEW would participate in the COSATI survey of agency STI obligations. The chairman of this effort was Peppino Vlannes of NASA. Dr. Cummings also agreed to chair the next COSATI meeting, in accordance with my plan to hold a series of COSATI meetings in 1971 at the individual agencies' conference rooms (203).

State of the Data Processing Industry

At my request, a special report was prepared to OST from the Data Processing Association, The State of the Data Processing Industry. The report was solicited to be used as input to the section on information, computers and communication in the long-awaited OST annual report on national and Federal science and technology. According to the letter of transmittal from DPA, the report was generated by a day-long roundtable discussion of acknowledged leaders of the data processing profession from industry, government, education, and journalism (204).

(204) Parker, James D., Jr., et al, International President, Data Processing Management Association, Subject: The State of the Data Processing Industry, January 12, 19761, pp 2. The round table discussion took place on December 29, 1970 in Chicago, Ill. The DPA report is 12 pages long; names of attendees were not provided.

Too long for inclusion in this book, a summary is provided to give readers an account of what the Association felt was important for OST to know in 1971.

The past two years have been a period of consolidation, catching up with the technology Techniques from operations research have been introduced to

practical use. Increased speed of the machine and skill of computer personnel are making a difference in the application of theories and concepts. High level management is becoming involved. Users are becoming better trained. The emergence of the minicomputer, selling for about $5,000, is promising. Trained EDP management firms are emerging, a break for many corporations starting from scratch in the use of computers.. There is increasing interest in data communications. New techniques are being developed for direct access to databases. The introduction of the IBM 370s has stimulated new similkar new equipment from from other major computer manufacturers. Modular software - input-output compilers and procedures compilers and optimizers - are emerging and prviding a "building block" approach to system development. Image storing will get considerable attention in the next few years. Individual work stations are beginning to be tied into the overall system. There is increased expectation that computer applications will be used to resolve environmental, ecological, sociological and political problems.

The report stated that new approaches and effort pertaining to such matters as education, privacy or protection of intellectual property are needed. The splintered approach to computer education must end. Specific comments in this section were:

High schools are doing a better job of computer education than universities. Colleges are lagging in the need to provide EDP training to those majporing in other disciplines and in adult education. Universities fail to give EDP courses to fulfill language requirements. Competent teachers are in short supply. Computer-makers have been forced to provide education and training. Computer-training has been found meaningless, unless students have the opoportunity for hands-on use. Training the underprivileged and handicapped has resulted in considerable disillusionment for many of them, as well resulting in the expenditure of large amounts of public and private funds.

The establishment of databases containing personal data hitherto has not resulted in serious privacy problems because access and centralization were difficult to achieve. With the arrival of computerized databases, access has brought considerable new concern to thoughtful citizens. Legislation is needed to protect the individual, on one hand, and to provide data that society needs, on the other. Similarly, protection of intellectual property now must receive attention.

Currently, neither patent or copyright laws apply to computer software. This protection is needed. DPMA believes that Federal software, not employed in national security, should be in the public domain.

New problems can be expected resulting from international competition and from new research.

Because of wage differentials, competition will be felt in minicomputers and peripheral devices, such as terminals, from abroad. The Japanese FACOM is said to have a two- or three-to-one price/performance advantage over the IBM 360/30 or 40. American confidence in electronic products made in Japan and other countries is becoming established; the same can happen with low cost Japanese minicomputers. The desire of many countries to

develop their own computer industries will make it hard to sell American-made computers abroad. These signs are seen in Japan, France and Canada. American firms are increasing their purchases of software for the development of software abroad.

Computer-related legislation is increasing. DPMA is afraid that much of it may result from ignorance or misinformation about computers rather than the human responsibility to see that they perform properly.

The report listed a number of areas where legislation was being considered:

A bill to license computer programmers and operators in California; a Labor Department investigation into whether or not computer people should be exempt; the Carterfone decision; the ADAPSO suit regarding a bank's right to engage in outside data processing services; the various anti-trust suits against IBM; the numerous FCC applications for microwave data communications networks; the FTC investigation into customer billing practices; and the IRS rulings on allowable tax write-offs for software development.

The penultimate section of this interesting report was devoted to research. It pointed out that historically much of the funding for R&D in the computer field was provided through government contracts, particularly those from DOD, but recent restrictions on DOD-research to support only defense-related activities could dry up this support. Funds for basic research should not be downgraded; actually, more is needed for this vital work; examples: parallel mathematics and parallel computer logic. Joint-funding with industry can only be a partial solution to the problem. The productivity of white-collar workers can be increased by the computer.

The final section was devoted to the general health of the computer and related communities.

The computer industry is relatively young and non-settled, hence it was hardly hit by the slowdown of 1970. especially newer and smaller firms. The Honeywell-GE merger was the big news, but this presages more "thinning out" of computer manufacturers in the next few years. The glamor of main frame developments is now being lost among users. We are moving into an "information pollution" era in which there is a vast generation of paperwork without getting the results needed. The computer industry needs a general review and appraisal. Until them, users should avoid buying newer and bigger systems. They should wait for technology that serves their needs, rather than vice versa (204).

Ironically, at least a few of the conclusions of the group assembled by DPMA at the end of 1970 could be written in the last years of 1980.

OST-COSATI

For a number of reasons, I began to wonder if the amount of effort that we were putting into COSATI was bringing us the quality of the results that we wanted. Of course, I was not alone in this concern. The quality agency STI managers were beginning to thin out in number. Full support of the

agency R&D managers began to diminish, not only for STI matters, but also for all of the Federal Council for Science and Technology programs. Attendance of the primary FCST members at regular meetings began to decline. Third and fourth-level agency representatives were common at the meetings. Agency STI managers hardly enjoyed interaction with the person who had responsibility for the agency's R&D program. Periodic agency STI reports to the R&D director began to decrease. STI staffs even in early 1971 began to diminish, reflecting this reality. How much of the lessening attention to agency STI matters on the part of the top R&D managers resulted from the less supportive attitude of the OST Director was hard to measure, but there was some suspicion that he contributed to this breakdown. There was considerable rationalization on my part that attitudes only partially contributed to the climate. R&D funding was being curtailed and the search by agency managers for R&D areas to cut was increasing. During such a period, information programs traditionally were vulnerable to curtailed funding. There was another reason that partially explained the difficulties we were encountering in the Federal STI area. Most of the agency R&D hierarchies were not worrying about STI deficiencies, perhaps feeling that the hard work done by OST and COSATI between 1962 and 1970 had paid off, thus there were no serious STI problems in the Federal government and certainly not in their own agencies. This may have been their attitude, reinforced by unwillingness to appraise conscientiously the real state of STI affairs in their agencies. As pointed out elsewhere in this book, there was no serious clamor from their R&D benchworkers for improved agency STI programs.

Whatever the causes, the only solution that was attractive to me and the small OST staff devoted to STI was to work harder and do more "selling." We argued for a COSATI Review Group effort to ventilate the problems and challenges that we insisted were continuing and emerging. We prepared agendas and terms of reference for independent reviews by outside experts. Among the areas that we wanted the study group to appraise were: selected agency STI programs and the quality and constancy of their internal stewardship, the management use of STI (especially R&D project-reporting data), the quality of information and data (more specifically the way to improve information analysis center programs), emerging national STI problems (such as evident in improving the environment and exploring space), emerging large scale data systems (Federal, national and international), expediting technical transfer through better information programs, examination of competition and cooperation among public and private STI actions, and further adoption of new information technology by agencies.

Whatever the state of our misgivings we held meetings with the COSATI panel chairmen and their executive secretaries in which we discussed trends, challenges, new directions, as well as the work each of them was involved in. We called on them to reduce "talky-talk" programs and work on efforts that would be brought before the FCST membership, efforts that would hopefully improve agency R&D performance. We called on chairmen to eliminate "dead wood" anmong their members. We asked Dr. Edward Brady, one of our strong COSATI members, to consider forming an ad hoc group on page charges and related matters. We held a meeting with a group of experts to discuss how the Patent Office information search and retreieval system could be improved. We met with Dr. Larry Goldmuntz, the new FCST Executive

Secretary, to fill him in on the COSATI STI program and what we hoped to accomplish in the next year with his help (203)

(205) Aines, Andrew A., OST, Comments Made at an Information Seminar at the Institute for Defense Analysis, February 10, 1971, pp 8.

One of the perplexing problems that concerned me when I was in the Department of Army and the Office of the Secretary of Defense was the difficulty of getting the Institute for Defense Analysis to focus on the subject of Defense STI and its communication. Several discussions were held with IDA leaders on this subject and with the passage of time, they agreed to listen to my reasons why IDA should become involved. I pointed out that information technology is being increasingly used in the Department of Defense and its contractors to contribute to and cope with the generative explosion of new knowledge. Paradoxically, information scarcity - the reason for research and development - was also increasing during this era. Obviously, this meant that better management and stewardship of technical knowledge was needed and this meant more institutionalization of the information process in DOD. Unfortunately, there was insufficient intellectual effort being applied to the development of a well contrived, well organized and well executed government-wide and DOD STI program. Not a small part of the problem could also be attributed to engrained information/communication cultural patterns among DOD workers. As time passes, we will see many changes in these patterns as information machinery and techniques improve and resistance diminishes. Organizational forms will also be affected as we move towards a higher order information-handling environment. Information management will be taken over by highly trained professionals, operating at the highest levels within major organizations. Improved application of knowledge created within an organization will also receive more attention as the cost and value of information increases. Even information handling in intelligence operations will be upgraded. Where feasible, we can expect to move deeper into the world of simulation and modelling as logical alternatives to expensive research, development and real-life experimentation. In such a climate, more attention will be given to information training and education. New professional personnel hired will be more apt in handling information electronically. The move towards compatibility in networking and increased use of databases will accelerate. Maxicomputer and minicomputer adherents will proliferate and make the welkin ring. One accepted measure of the status and efficiency of organizations will be the strength of their information-handling talent. Congress will become a stronger factor in the information business, and this, in turn, will have an effect on the information operations of the Executive Branch. As we become more information-sophisticated, we will exhibit increased willingness to attack the formidable information problems involved in complex crisis management and problem-solving. This will be an uneven process, to be sure, since some problems and issues will have higher priority than others. I concluded:

I would like to see IDA play a role in appraising DOD's large, but often faulty, information systems in command and control, intelligence, logistics, personnel administration, and, of course, research and development. This should include a look at interface problems and

obstacles that inhibit the necessary flow of information within individual systems.

It would be delightful to assert that IDA enthusiastically picked up the torch for this approach, but, although the demand for improved STI management continued to grow within DOD, it was apparent that IDA leadership decided against serious involvement. This should be considered less a criticism of IDA than an indicator of the relatively lower priority science communications had in the defense community. It is true that IDA had not been called upon by DOD authorities to staff up in this area, hence it had not seen any great need to hire any well known information experts to join its staff. IDA did have a highly competent librarian, Ruth Smith, who, because of her professional achievements, could easily have been the nucleus of an information research group. Ultimately, Ruth Smith left IDA to join the staff of NTIS, where she made an outstanding contribution.

(206) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Report of Meeting on the Oates Computer Education Study, February 14, 1971, pp 4.

Reported elsewhere in this book is the tale of the Oates Panel Report, a product of Dr. Anthony Oettinger's NAS-NAE Computer Committee. The report prepared by the group was an expression of alarm that the United States was still too passive in meeting the challenges inherent in the impact of the computer. It called for the formation of a Presidential Commission to recommend further steps, but it did not provide any additional insights to dramatize the need. Dr. Edward David agreed to a meeting that brought him together with Dr. Oettinger, Dr. House, also Dave Beckler and Andrew Aines of the OST staff. At this meeting, Oettinger strongly opposed the notion of a full scale review of the study by PSAC or a formal panel, but he did not object to a review by a small, select group composed of members of PSAC and OST. Although the Oates group was terminated, Oettinger stated his willingness to assemble some of its members to interact with OST, hoping that this would result in OST support of the major recommendations of the report. Alternatively, he was willing to make a presentation himself to OST on the findings of the Oates Panel. He stated that the study started out to be a follow-up effort of the work of the earlier PSAC Pierce study on computers and higher education, but during the study, the panel concluded that the educational aspects were too limited and widened the scope of its inquiry. Dr. David agreed that while the problem was important, he did not think that the report had made a sufficiently strong case for a Presidential Commission, but he would be willing to prepare a version of the report to send to the President. He stated that there were still questions to be answered such as: What is the real problem? Is the marketplace unequal to the challenge? How bad is the need for standardization? Is it up to the government to try to reform industry? Could we succeed where FCC has failed to establish regulations to control the computer? He went on to say that he could see the need to come to grips with such issues as privacy, compatability, and even the computer in education. Work might be done in computer-aided design and possibly management information systems, but how does one get a handle on the whole raft of problems associated with teleprocessing? He stated that he was considering the possibility of a PSAC panel to determine what

actions could be undertaken in this field, but he also recognized the problems of the time scale and the slowness of panel studies (206). Oettinger and House asked me for a follow-up meeting to obtain my views, to which I agreed. I told them that I agreed in large part with Dr. David. Most of the recommendations had been made in other reports.The report, as written, would not ignite excitement, a necessary stimulent for action. At that time, there was little enthusiasm in the Executive Office of the President about creating Presidential Commissions. The lack of full NAS-NAE support was an obstacle hard to overcome. I concluded by pointing out that while I supported the need for more vigorous action, a minor miracle would be needed to make this happen.

In my comments to Dr. David, I stated that I saw the need for a more "muscular" approach with the government playing the lead role. There was a requirement, I pointed out, for more answers for questions such as:

What should the American posture be towards the rest of the world in respect to the exportation of information technology in the immediate and long-range periods?

What specifically should we do to train our youth and upgrade the information-handling capabilities of our work force?

What kind of government-supported R&D and information networks should we advocate in this area to ensure reasonable U.S. leadership?

What new high level government entities are required to cope with growing needs in this area?

In addition to the studies, I advocated a program to educate and motivate the leaders in the many fields, who were or should be involved in the process, to the benefits that might accrue from a strong program, and whose support would be mandatory to attain progress and obtain resources. This might be kicked off with an OST or a White House Conference on the Significance of Modern Communications, bringing together leading communicators, social and physical scientists, university presidents, and others to discuss a subject that will become more and more important with each passing day. I concluded by recommending that OST take the leadership in such a crusade (206). This plea, regretfully, did not result in any action, but I recognized that the life of the Science Advisor was anything but easy during that period and undertaking new initiatives would be difficult. I relate this incident less from nostalgia and more because I believe that there is still need for greater action, despite the progress that has taken place.

(207) Meadow, Charles T., OST, Memorandum to David Z. Beckler, OST, Subject: NSF Support of Academic Computer Centers, February 18, 1971, pp 2.

National Science Foundation

Considerable discontent was being expressed by universities, who were then being told by NSF that direct facility support for academic computers centers was discontinued. The practice had been undertaken by NSF to help

universities establish or upgrade such centers. The notion was to provide support for 2-3 years, then discontinue it with the expectation that continued financial support would come from charges to users, who were to a large extent holders of Federal grants and contracts. According to NSF, the decision was made by OMB originally, but it was one with which NSF concurred. OMB spokesmen claimed it was an NSF decision with which OMB concurred. The reason given by both was that they had reached an agreement that it would be better to support research users than the computing facilities. The problem that the universities ran into was a cutback in research funding, as well as funding of academic computer centers, that resulted in a double squeeze. NSF officials pointed out aht there was a 15 percent increase in academic support scheduled in 1972. This would alleviate the problem considerably (207). This episode is included in this book for three reasons: firstly, to show that NSF support for university computing started many years ago, secondly, to reveal a shift in a funding policy that the universities found counterproductive and perplexing, and thirdly, to make the point that too little credit has gone to the Federal government for its assistance to universities in helping them enter the Computer Age.

(208) Aines, Andrew A., OST, Memorandum top Dr. Edward E. David, Director, OST, Subject: Summary of the Week's Activities, February 20, 1971, pp 4.

COSATI

The February 1971 COSATI meeting was held at the National Bureau of Standards, Gaithersburg, Maryland. It was chaired by Dr. Edward Brady, DOC's representative to COSATI. The meeting focused on secondary information services. Speakers were: William Woods (Engineering Index), Stella Keenan (National Federation of Science Abstracting and Indexing), Phyllis V. Parkins (Biosciences Information Services) and Dale Baker (Chemical Abstract Service) (208). During the 1960s and early 1970s, it was OST and COSATI policy to maintain close interaction with the professional societies. On the whole, the societies were cooperative and pleased to work closely with the Executive Office of the President. In recent years, as a result of the termination of COSATI, also the lack of a vigorous STI program in NSF, this kind of liaison has diminished almost to the disappearing point. Dr. Herbert Koller, Executive Director, American Society for Information Science, inquired about the recent Federal R&d budget and what steps were being taken to provide more funds for Federal and other STI programs. We had to provide him with a non-committal answer, because we were unable to obtain such data without a large aned time-consuming study. One problem was that none of the agencies could provide the data. STI line item funding, which came out of the total R&D pot for the most part, was not required by OMB and the agencies (207). This remains a problem to this day.

Congress

Representative Roman Pucinski, who did not take defeat lightly, was back before the 92nd Congress with a new bill, H.R. 1040, to establish a National Data Processing and Information Retrieval System. In this new initiative, Mr. Pucinski made a dramatic shift from the concept of a monolithic, Chicago-based, national information center for science and

technology, to one of a coordinated, decentralized information system (207). It was a stillborn effort; obtaining allies in Congress and the Executive Branch turned out to to be a lost cause.

International

Anticipating some of the events during the Reagan administration to privatize government programs, Lord Eccles in the United Kingdom advocated a change in the status of free libraries and the intellectual rights of authors in England. If this transpired. Minister Eccles wanted to recommend the emding of subsidies to authors and to have them them contend in the open marketplace for revenues. The Copyright Law might have to be amended to provide more funds to authors. This gambit was not well received on both shores of the Atlantic. An editorial in the London Guardian (February 19, 1971) saw this as yet more evidence of the dimunition of cultural services available free to citizens. Also lamented in the newspaper was the news that the British Consumer Council, which turned out publications that help consumers, had its budget cut. How to get rid of its stocks of publications was then being debated. The practice in the United States during this era differed sharply in making consumer-type information available (208).

During the week being reported, I had spent several days in meetings with Dr. Rene Whitehead, the Canadian scientist, who chaired an OECD ad hoc task force on upgrading information and computer policy. As the U.S. representative to the OECD Information Policy Group, but who also monitored the work of the OECD Computer Utilization Group, I had felt that there was wisdom in combining these two groups because their work was beginning to overlap. For this reason, I accepted membership on the Whitehead panel, which was charged with coming up with recommendations for a union of the two panels. The Executive Officer of the CUG was all for the change; his counterpart of the IPG, Peter Judge, was against the prospect of a combined effort, although he made it clear in private conversations that he did not want to appear to be an opponent of the change and the views of the Americans and the Canadians. The Whitehead Panel ultimately came up with a recommendation that the two efforts be combined. After the union was affected, some months later, Peter Judge emigrated to Australia to head the Australian National Library. While in Paris, I met with Dr. Uwe Thomas, OECD, about an excellent paper he had prepared for OECD on computerized databases in public administration. At his request I prepared a critical reading of his study and proposed a number of what I considered to be constructive changes. I discussed a proposal with Dr. Philip Hemily, U.S. Mission to OECD, of the feasibility of distributing OECD documents by NTIS in the United States. I thought this was a good proposal, but OECD wanted to retain its own distribution office in Washington. I held discussions with Carl Wait, U.S. Mission to OECD, about environmental quality technical information, then being discussed in Europe as a necessity and how the United States could help in the information program. Also discussed was the UNISIST program of UNESCO with Scott Adams, who was working with UNESCO in organizing a major meeting scheduled in October 1971. It was a very busy trip, but, on the whole, I felt that we had made some progress.

(209) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Intelligence Surveillance, February 22, 1971, pp 4.

Congress

The eternal battle between the Executive and Legislative Branches for information continued to rage on. Senator Ribicoff, Connecticut, tried hard to get a bill through the 91st Congress which would direct Executive Branch agencies to give GAO investigators such information and documents that they wanted. Failure to do so would permit GAO to take Federal officials to court. It would allow GAO to subpoena records of contracts and other documentation from firms doing business with the government. OMB and DOD were joined in fighting for the status quo. They succeeded in winning this skirmish (209).

Congress was discovering the potency of television and decided to dip its foot into the water. I relayed information about this development to Dr. David with the following comments:

I see a tiny, but highly electronic cloud in the sky. The House has discovered Marshall McLuhan and Madison Avenue. It will have its own half-hour television show,"Ask Congress," on selected local TV stations with the express goal of rebuilding the prestige of the House. Legislation passed in 1970 permits live broadcasts. There is no doubt in my mind that when CATV spreads with many hungry channels searching for filler materials, government-originated programs will get more attention. Perhaps it is time to start planning Federal agency STI programs to include non-controversial materials for the growing "electronic set."

It took years before the popular C-SPAN cable TV programs came into being. Years passed before the Senate succumbed to the same virus. The Federal agencies, including the Executive Office of the President, are still on the outside, unwilling or unable to join the Legislative Branch.

Congressman Jack Brooks, Chairman of a House Government Operations Subcommittee, called for a COBOL validation center that would serve all of the Federal agencies to be operated by GSA with NBS technical support. The financing would come initially from an ADP revolving fund, but later on, COBOL suppliers would pay the bill by having their compilers certified by GSA and NBS (209).

Standards

It was well recognized in the 1960s and 1970s that during an information revolution standards development were of great importance, especially for countries which were leaders in information technology. A National Bureau of Standards Metric Study Group warned that unless U.S. industry gave its representativeas involved with international standards stronger negotiating authority and better financing, it would lose out in the world market. It was expected that the International Standards Office and the International Eklectrotechnical Commmission were expected to establish over 90 percent of international technological standards. The Study Group pointed out that private financing of ANSI was dropping off and that this was affecting U.S. representation on ISO committees. I wound up my

statement to Dr. David by suggesting that a high level ad hoc study group be formed to study the problem and make recommendations. Much to my amazement, Dr. David wrote beside the item, "Important! Wonder if PSAC shouldn't study this?" I thought that he might put it before PSAC as a future project. He might have discussed it with this group informally, it is possible, but I heard nothing more that showed a desire that we should get on with the project. On reflection, I concluded that I should have tried harder (209).

The early 1970s was a period that enshrined, at least temporarily, the notion of metrification. Stimulated by a series of events and trends, political power was employed to move in this direction. OST sent a questionnaire to agency heads to determine their views on specific responsibilities for the government. The National Bureau of Standards gave the program high priority and undertook a series of studies on various aspects of the subject. Considerably more attention was given to all kinds of standards in the process. Those of us in COSATI involved with information program development found it necessary to create standards where none existed previously. In the general area of standards, as the movement began to grow, I prepared a memorandum for Dr. David on November 3, 1970, suggesting that he might want to make a public statement about standards development, and if he did, there were a few points that he might think about including:

The United States joins with other countries in this crusade. Our best hope for change lies in preparing the younger generation with a strong program of education and motivation. The facts of metrification need to be delivered to all of the people, however. Professional engineering societies should be encouraged to take leadership in the effort. The National Bureau of Standards should be the principal focal point of the Federal government. The year 1976, the bicentennial year, should be made a target date for conversion. If he is willing, the President should be asked to make a statement that will encourage those who are taking action (210).

(210) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Suggestion for Future Speech or Statement (On Metrification), November 3, 1970, 1 page.

Network development was beginning to speed up. The Systems Development Corporation, which had been deeply involved with COSATI in its national systems studies, announced a general purpose information retrieval system for users of IBM OS/360 users called Orbit II. Search and retrieval from files as large as two million records, together with their updating, became a reality. Up to 150 online users could be served. I am certain that SDC's work with a few Federal agencies in assisting them create their bibliogaphic information systems made this commercial initiative viable, a form of technology transfer that has received little public attention (209).

About the same time, one of the first beachheads of the Japanese computer invasion was evidenced when Squibb-Beechnut, Inc. purchased a Fujitsu Ltd. 48K FACOM 230-35 computer for the attractive price of $400,000. The Japanese invasion into the computer field had started (209).

Privatization and Federalization

The president of Planning Research Corporation, Dr. Robert Kreuger, announced his concern about a growing trend of "federalization of private enterprise." His target was the establishment of Federal Contract Research Centers. He asked for some kind of office in the Federal government, presumably, that would keep its eye on government programs that could be undertaken by the private sector. Currently, the concern of many individuals in the Federal government deals with the "privatization of Federal government facilities." Thus, the pendulum swings (209).

University

Dr. John Kemeny, President of Dartmouth College (and a fellow member of the U.S. National Commission on Libraries and Information Science), who had done much to develop Dartmouth's Time-Sharing System, was quoted in Datamation (February 15, 1971) as saying that he does not see how an American executive can get along without a computer. Kemeny was proud of the computer thrust identified with Dartmouth and could not understand why time-sharing had not spread among colleges faster. He pointed out that Dartmouth was primarily a liberal arts college, but its students excelled in the use of computers. He proudly admitted that Dartmouth undergraduates brought their dates to the Dartmouth computation center during big football weekends and winter carnival time, a claim that could not be duplicated at any other academic institution (209).

(211) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Activity Report, February 27, 1987, pp 4.

International

The Agency for International Development made progress in organizing its Symposium on the Role of Computers in Developing Countries, a project led by Glenn Schweitzer of that agency, and one that had the support of OST. Its purpose was to develop consensus on what actions by the United States were needed. The memorandum to Dr. Davis contained a copy of the draft agenda for the meeting on Information, Computers and Communication, which was held on March 4-5, 1971, at the Canadian National Library, Ottawa, Canada, a meeting that was chaired by Dr. Rennie Whitehead, Principal Science Advisor to the Canadian cabinet. Dr. David was invited to attend, but could not because of previous commitments. At OST's recommendation, the chairman of the COSATI Panel on Legal Aspects of Information Programs, John Farmakides, was invited by the Department of State, based on COSATI'S pioneering involvement in information policy matters, to attend the World Intellectual Property Organization (WIPO) which was holding meetings on the subject in Geneva (211). The National Science Foundation, at our request, agreed to his availability for this purpose (217).

Congress

It was quite evident, when I attended the first session of Senator Sam Erwin's hearings on computer databanks, held under the auspices of the Senate Subcommittee on Constitutional Rights, Senate Committee on the

Judiciary, that this was a media event. An army of reporters and cameras held center stage, attended by a host of young, concerned persons, highly emotional about the hot issue of the day, the protection of privacy. Few of the information "regulars" were to be seen. The dour thought struck me that because of the amount of orchestration in evidence, this particular affair demonstrated that the Senate hearings had at least three purposes: a legitimate congressional hearing to gather views from witnesses on the serious issue of privacy protrection, an exploitive prop for the media, and an opportunity for those generally distrustful of the computer to vent their concerns (211).

Microfiche standards were still being discussed in 1971. Charles Meadow, OST, attended a meeting called by Nick Spense, the Public Printer, to discuss possible microfiche use by the Government Printing Office. Concern was expressed by the private sector representatives whose firms were already disseminating government documents in microfiche about the possible establishment of yet another government microfiche standard by the Government Printing Office, this one with a 42 to 1 reduction ratio. Many of the microfiche readers in use were already adjusted to the COSATI-approved 24 to 1 reduction ratio. COSATI members were unhappy because representatives of the GPO had an opportunity to make their views felt during the period COSATI was studying what the most appropriate microfiche reduction ratio should be. The Library of Congress, on the other hand, worked very closely with COSATI during the 1960s. I was invited and accepted an invitation to interact with LC in a series of meetings devoted to the development of its RECON bibliographic control project. This kept me apprised of
the progress of the LC MARC II project. The reception of the MARC II format by the library community was, at that time, still spotty with a few notable exceptions. However, it had become an ANSI standard and was being considered by the International Standards Office, along with the COSATI standard on technical reports, approved by FCST (211)

United States Patent Office

One of the Federal agencies that seemed always behind the information systems power curve was the U.S. Patent Office. It was simply unable to establish a satisfactory patent information system, even though long strides were taken in developing information systems for science, technology and other fields. The problem was also a concern of the American Patent Law Association and other groups dependent on the efficiency of the U.S. Patent Office. APLA had created an Information Retrieval Committees to do what it could to accelerate remedial action. Representatives of the latter group invited Dr. Edward E. David to make a talk about full text information retrieval systems particularly for chemical practice (212).

(212) Fay, Robert J., Fay, Sharpe and Mulholland, Attorneys, Patent and Trademark Law, Cleveland, Ohio, for the American Patent Law Association Information Retrieval Committee, Letter of invitation to Dr. Edward E. David, Office of Science and Technology, December 4, 1970, 1 page.

Dr. David accepted the invitation about a week later. I called Michael Kirk, who was on the staff of the Commissioner of Patents, for help in

preparing the speech. Little was forthcoming. Another letter was sent by Dr. David to William L. Keefauver, Director of Patent Law, Bell Laboratories, Murray Hill, New Jersey, asking the latter for advice on the subject of full text information retrieval systems. Keefauver wrote a thoughtful response to Dr. David on January 19, 1971, some of which is summarized as follows:

In an examination patent system, the quality of the issued patent depends heavily on the quality of the of the prior art search. Critics point out that the quality of searches made in the U.S. Patent Office have been decreasing in recent years as the volume and complexity of the prior art increases. Searching patents takes up more than half of the time of the more than 1,000 patent examiners, yet the R&D portion of the Patent Office has been trivially small - about 1 percent of the total budget in recent years. This money has been spent in the area of computer-aided classification up to recently. A couple of new Patent Office information programs - keyboarding full text onto magnetic tape and computer-aided printing of newly assigned patents - are on the right track. The Patent Office has no program to gather and store computerized technical information for use in patent searching and assignment, even though the value of gathering technical information in certain key programs was recognized in the Patent Office as early as 1957.

(213) Keefauver. William L., Bell Laboratories, Murray Hill, New Jersey, Letter to Dr. Edward E. David, Director, OST, January 19, 1971, pp 3.

Additionally, a meeting was held on the subject of use of natural language search techniques at the Patent Office by an informal panel made up of Andrew A. Aines and Charles T. Meadow, both of OST, George S. Kondos, Department of Justice, Stephen J. Tauber. NBS and ACS, and Donald E. Walker, Mitre Corporation. Charles Meadow wrote a comprehensive report of the meeting proceedings and concluded with these remarks:

Political Reality: Will Congress provide funds and is the effort worth it in terms of costs and benefits. The question which the Administration must eventually answer is how shall the Patent Office best promote progress in science and art? Also what can the APLA do to help in arriving at this decision? (214)

(214) Meadow, Charles T., OST, Memorandum to Dr. Edward E. Davis, Director, OST, Subject: Use of Natural Language Search Techniques at the Patent Office, February 18, 1971, pp 7.

It was evident during the 1960s and 1970s that the patent information system was far from perfected. In subsequent years, a concerted effort was made to bring this system up to par, but in the early years of information system mechanization, it seemed to resist improvement.

Views on Computing Matters

My old and valued STI colleague, Walter Carlson, who departed DOD to join the IBM staff at Armonk, New York, reappeared in 1970 as the President of the Association for Computing Machinery. Knowing that OST was preparing an annual report on science and technology, Carlson met with me late in 1970

and followed this up with a letter setting forth some of his personal
views and those of his ACM associates. A brief summary is presented below
as representing contemporary thought in this time-frame (215).

(215) Carlson, Walter M., President, ACM, Letter to Andrew A. Aines, OST
Staff, December 30, 1971, pp 5. The Carlson letter was sent to Dr. David
via an Aines' memorandum Subject: ACM Views, March 1, 1971, 1 page.

Carlson prefaced his letter with a reminder of the work being done by the
NBS Center for Computer Science and Technology, led by Dr. Ruth M.Davis,
the NBS-NAE Computer Science and Engineering Board, chaired by Dr. Anthony
Oettinger, the NAS' Panel on Privacy Issues, headed by Dr. Allen Westin,
and the forthcoming book by Dr. Martin Greenberger, entitled: Computers,
Communications, and the Public Interest. A few of Carlson's statements
appear as follows:

There now exists a large body of proven technology without adequate
mechanisms to inform people of its existence. Computer knowledge,
therefore, is restricted to an elite establishment. Too little effort is
expended on educating "thought leaders" about information technology. The
gap between available technology and and education about the technology is
actually widening. Needed is more standardization, programs to humanize
computer and information systems technologies, and formal courses to "re-
tread" young professionals who missed computer exposure. There is need to
protect intellectual property represented in computer software, for laws
protecting hardware, software, and restricting unfair competition. The
Carlson letter also addressed data security, standards for professional
behavior, and called for the formation of a National Computer Institute to
tackle the huge societal problems that would be tractable only with
computers. He quoted John Kemeny. attendees at a RAND symposia, and Ralph
Nader as advocates, in one form or another, for such a national resource,
based on the use of computers and operated in a governmental framework
(215)

Another input came in the form of a report on long-range plans for
automatic data processing in the Federal government (216).

(216) Hill, W. Henry, et al, Task Force for Developing a Long Range Plan
for ADP in the Federal Government, Interagency Committee on Automatic Data
Processing. This task group was formed at the suggestion of OMB. More
specifically, the task group was asked to develop a position paper which
woupld project the Federal government ADP posture over the 1970-1980 time
period. The task force postulated at the outset that time and resources
available were inadequate to develop a long-range plan or even to
consolidate the agencyh long-range plans, if such existed. After a number
of meetings with government agencies and executive sessions, the task
group made a number of recommendations, some of which are shown below:

A Presidential Commission, composed of full-time designees from the ranks
of government and augmented with individuals from the private sector,
should be established to do more effectively what the task force was asked
to do above. The Commission should develop its own conclusions and
recommendations on long-range planning. Major issues that should be
addressed included: management structures and attitudes, competence and

availability of required personnel, long-range perspective of ADP, needs for R&D fortechnology improvement, legal and regulatory needs, et cetera.

The President should supplant President Johnson's 1966 memorandum to reaffirm a Presidential concern with the subject and to direct agency heads to upgrade their ADP programs in accordance. In the meantime, OMB should demonstrate new or stronger attention and leadership in the ADP area. The General Services Administration should strengthen its government-wide efforts dealing with ADPE evaluation, selection, acquisition, maintenance, resource-sharing, etc. The National Bureau of Standards was advised to strengthen its activities in scientific and technological advisory services, establish and implement uniform standards within the government and interact with other countries in uniform standards development. Other Federal agencies should strengthen their structure to expedite long-range planning, systems and applications research and development, and facilitate beneficial innovations made feasible by ADP technology.

International

The long-awaited UNESCO-ICSU meeting to launch the UNISIST global information program was scheduled fopr October 1971. It was my decision that the program was sufficiently important to the Executive Office of the President so that OST should be the focal point in creating the U.S. delegation. I asked Dr. David, therefore, to consider chairing the delegation. Dr. Harrison Brown, the Foreign Secretary of the National Academy of Science and the leader of the UNISIST program, agreed that Dr. David would be the best choice to head the delegatation.

U.S.-Canada Meeting

The Canadian government officials turned out to be splendid hosts to the eight Americans who made up the U.S. delegation at the information-communications meeting held in Ottawa early in March 1971. There was visible anxiousness exhibited by one Canadian official, an adherent of the "Keep Canada Independent" political program, about the overwhelming size and scope of our Federal and national information programs. I proposed that the Mexican government be included at the next meeting of the U.S.-Canada, if one was held. It was evident that the Canadian science representatives from the Privy Council had been somewhat out-maneuvered by the very able Guy Sylvestre, the senior librarian in the Canadian government, in national library and STI programs oversight. Sylvestre argued against bringing the Mexicans into the picture, and cited his preference for a discussion of U.S. and Canadian issues and problems, rather than talking about governmental information programs. It should be remembered that the Canadians were suffering economic and unemployment problems at the time. The bad times were creating problems,
thus they were worried about real or imagined economic and cultural domination and exploitation by the United States. This was seen in an increasing number of books on this theme, such as Silent Surrender and Close the 39th Parallel, also the growing retrictions on U.S. ownership of Canadian businesses. This was sad, because the Canadians needed new capital from U.S. sources desperately. Despite these unexpected, unpleasant, and luckily infrequent overtones, we found that most of the

Canadians we dealt with were open, forthcoming and sincere in all of our interactions. We continued to learn from one another. However, this meeting was the last of the U.S.-Canada intergovernmental information interchange programs, organized and hosted by OST. Thus, the Mexicans were never invited to subsequent get-togethers (217). Too bad; we might have been able to establish a long-standing arrangement involving the three governments.

COSATI

Unable to attend the meeting of the COSATI International Affairs Panel, which he chaired normally, because of a NSF budget meeting, I substituted for Mel Day as chairman of what turned out to be an interesting meeting. AID's Glen Schweitzer made an excellent presentation about his agency's increasingly extensive programs in STI and computers. Richmond, the COSATI representative from the Department of State, discussed the more liberal STI-sharing program with countries like Cuba and Mainland China. In a separate meeting, Dr. Wolfgang Ettel, who was in charge of the Washington office of the German Institute of Documentation, and who formerly was on the OECD information-computer staff, discussed his program to acquire U.S.-generated STI for his government. Most of his focus was on obtaining STI in documenary form from open sources. Another meeting was held with Kenneth Katz and John Madden, both fromn the Canadian Ministery of Communications, to discuss the work of both countries in the databank privacy area. John Green and Robert Brainard, both from the NAS, talked to Mel Day and myself about their new program to help AID in information programs for developing countries.

Downie Report

I continued to be concerned about the implementation of the excellent Downie STI Dissemination Report. Larry Goldmuntz, the new Executive Secretary of FCST, and I discussed what needed to be done in this connection. It was my belief that what we needed was a strong OST push; logically, Goldmuntz wanted to focus on what FCST could accomplish. The point that "grabbed" me was recognition that FCST's acceptance of the study put the burden of implementation directly on the   shoulders of the FCST members. We agreed to continue to search for expedited agency action.

OMB

A wide-ranging meeting was held with OMB's Joseph Cunningham, who was then in charge of that agency's computer programs. He agreed that his agency lacked a consistent program in the STI area. The problem, he pointed out, was the lack of coordination between a number of OMB groups involved in one phase or another of computer, information and communication programs. Hew appreciated OST,s continuing effort to keep OMB informed (and involved) in its information efforts. He agreed that the flow was mostly from OST to OMB and not vice versa. I asked him what he could do to help us improve the budget of the Dr. Davis' NBS computer program, which was then operating severely under-funded. I described the work of Oettinger's NAS Computer Panel, especially the Oates study, reported on elsewhere in this book. It turned out that he was unfamiliar with this program.

Cunningham was invited earlier to attend the U.S.-Canada meeting held in Ottawa. At this meeting he repeated his apology for not being able to attned (217).

(217) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Weekly Communique, 8 and 13 March 1971, pp 6.

Office of Education

How adequately do Federal agencies coordinate with each other and with non-Federal information groups? The answer, it is believed, shifts with time and organization. During the days of COSATI, there was a strong push for coordination and cooperation, yet some organizations placed less than high priority on this requirement. Agency R&D leaders, usually competitive in outlook, were often reluctant to share information about their work. A few of the R&D leaders and their were more scrupulous in exchanging technical information in those areas where more than one agency were engaged in similar research. However, the vigor of R&D leaders in stimulating information interchange was uneven, often depending on the pressure applied from above. This is one reason for the spotty receptivity to the R&D project information sharing work of the Science Information Service. It may also explain some of the difficulty that we encountered in establishing a government-wide project-reporting system. Also exhibited from time to time was a reluctance on the part of most agencies to track the results of their R&D outlays. Few of them saw the merits of establishing a small internal group to keep tabs on positive and negative results. This was pointed out to Burton Lamkin and Harold Lyon of the Office of Education, both involved in the library and information science area for that agency, which had spent millions of dollars in that program over the years, but had failed to create a program to coordinate closely with COSATI and other Federal agencies involved in educational research. The Office of Education was not alone; other Federal agencies also showed little inclination to upgrade their coordination efforts, even occasionally within
or between their own components (217)

Department of Defense

The gradual degeneration of the Department of Defense STI program was a personal, as well as professional, concern. A stewardship review of the Air Force STI program was requested. Two Air Force representatives came to OST, accompanied by Walter Christensen, the DOD STI focal point, to report on their STI program. It was clear at the outset that the headauarters of the Air Force had divested itself of the program by turning the leadership of the program to the Air Force Systems Command, located at the Andrews Air Force Base. There was little evidence that coordination within and between laboratories was a priority. Interaction with laboratories and other service headquarters was negligible. The Air Force operatives who in the past had been more energetic in coordination matters (Downie, Hoshovsky, Wooster, Swanson and Grimes are examples) had left the Air Force or had been reassigned to other duties. Strong replacements had not been made available. The current Air Force STI manager at that time (1971) was a relatively low level staff person in the Air Force Systems Command. I complained to Christensen and on one occasion directly to the AFSC

leaders, but nothing seriously happened to remedy the problem. I reported to Dr. David, A strong letter should be prepared to the Department of Defense over your signature asking for improvement over your signature." Nothing happened (217).

Department of Commerce

Page Charges

A problem that continued to haunt us dealt with adherence on the part of Federal agencies to the page charge convention, which they agreed to support in FCST. Earlier science advisors also threw their support behind the convention in letters to the Federal R&D agencies. When Federal funds got tight, the professional societies usually complained that some agencies were economizing on page charge payments. Dr. Edward Brady was appointed to undertake a survey of the problem and make recommendations for remedial actions. Dr. Brady, during a discussion of the task, brought up the problem of his COSATI membership. With the return of William Knox to head NTIS, Brady thought that Knox ought to be designated as the Department of Commerce's COSATI representative. I pointed out that the decision to appoint the COSATI representative fell on the shoulders of the Department of Commerce.

American Business Press

A meeting was arranged between the leaders of the American Business Press group and Dr. Edward David. The visitors were much interested in the views of Dr. David in a number of areas: science communications, the health of sss
science and technology in the United States, unemployment among scientists and engineers, then a problem. Their message to Dr. David was a hope that OST and the Administration would remember the importance of the technical press in the affairs of science, technology, and the well-being of the country. They brought no petition for specific actions and apparently departed well pleased about the reception they revceived (217). Having no information to the contrary, I have to believe that this was the last meeting of this type with a science advisor to the President.

Environmental Quality

The desire to improve Federal environmental information programs continued. Dr. Henry Kissman's SEQUIP report was almost completed. A meeting was held with Buckley, King (both from OST), Kissman, several State Department officials and others to address what the U.S. Government input to the ECE environmental quality data effort should be. EPA's Victor Searle was selected to head the EPA STI program and briefed by me on the diverse efforts OST and COSATI were involved in the environmental quality information front (217).

Software-Sharing

Jack Stearns and Robert Bell, NASA, proposed that a group be formed under their leadership to spread the use of the RECON program to other Federal agencies, and to promote Federal software-sharing, an idea that Mel Day

discussed with me before he left NASA. I agreed that the idea had merit and invited them to prepare a charter for a small ad hoc group to promote the sharing of Federal software (217).

The Information Revolution Circa 1971

In a periodic report to Dr. David about events and trends in the Information Age, I wrote (summarized):

The tremendous closed-circuit television heavyweight battle between boxers Frazier and Ali brought a gate of $35 million, which included $2.5 million for each fighter. This is the kind of phenomenon that we can expect to grow in the future. A curiosity was a computerized television fight between Ali and the deceased Marciano, which was won by the latter. Local telephone service for the Washington area was
announced by AT&T Co. The cost would be about $160 a month, which would include 30 minutes of calling time; thereafter, the rate would be about 25 cents a minute.

Sponsors were scarce, potential users uninterested, and the service was ultimately terminated, much to AT&T's disappointment. The use of taped messages which are playable back to telephone users is beginning to grow.

 A call to one number, at the Department of Defense, described a South Vietnamese troop movement into Laos. Countering this was another taped message from Senator Hubert H. Humphrey, this denouncing the move into Laos. A call to a number in DHEW brought the message to users not to look directly at the sun during an eclipse. As many as 400 radio stations were to use this number prior to an eclipse in March 1970. Senator Charles Mathias of Maryland leaped on the bandwagon of those worrying about the growth of databases that might infringe on the privacy of individuals. Said Mathias:

 "Our basic freedoms are at the mercy of an anmoral technology and ...the right to be "left alone" will be trampled on." Mathias then returned to the center, stating: "I do not believe we are doomed to perpetual war between computers and the Constitution; we can civilize our technology so as to promote both justice and liberty." (218)

Anticipating events in the 1980s, RCA asked FCC for clearance to build and run a $200 million domestic satellite system to carry TV programs, computer data, and other transmissions. Other corporations expressing interest at that time were: COMSAT Corporation, Western Union, Lockheed (with Microwave Communications of America), Hughes Aircraft, Fairchild Hiller, and Western Tele-Communications. The RCA proposal called for 13 major earth support stations and three satellites to be placed in geostationary orbit, but there was no indication that RCA or the other corporations were interested in providing their own launchers or using non-U.S.government-provided launchers during the period of the early 1970s. The availability of private sector or foreign government launchers was a development that took place in the 1960s.

OST Program Report and Wish List

(219) Aines, Andrew A., OST, Memorandum to Robert Barlow, OST, Subject:
Material for OST's Appropriations Hearings, March 18, 1971, forwarded
March 16, 1971, pp 3, plus covering note.

At the request of Bob Barlow, a document was prepared for possible use of
the Director, OST, at the OST's appropriation hearing before Congress. In
it, we advocated the creation of a national chemical information system
because of the importance of chemistry as a component of science and
technology, pointing out:

Through OST policy guidance and NSF funding, the American Chemical Society
has been encouraged in a dual program (involving public and private
efforts) to create an authoritative, computerized registry of chemical
compounds--some million and a half substances are included to date--and
represent the United States in creating an international chemical
information system, which calls for a cooperative, cost-sharing program
with other nations.

The report then reported that

The extraordinary growth of information and data programs in government,
many moving towards computerization, is having a considerable effect on
more traditional information centers and libraries. This is demonstrated
in a number of actions undertaken by OST and COSATI: landmark studies to
determine problems and prospects resulting of proliferation of information
and information delivery systems; the broadening of COSATI's membership by
inviting the participation of managers of public and private sector non-
R&D information programs; preparation of COSATI and Federal agency annual
reports detailing progress made in science communications; interaction
with foreign governments and international organizations interested in
creating global science communications programs; support to NAS-NAE in
establishing the Committee on Scientific and Technical Communications
(SATCOM), which has turned out a formidable report with over fifty
recommendations; participation in the establishment of the U.S.National
Commission on Libraries and Information Science; studies undertaken to
perfect an environmental quality information and data system; and
stimulating the development of over 120 government-supported information
analysis centers to serve speciaized users in science, technology and
education (219)

Privacy Guidelines

Although Congress was well embarked on a course of action that would
result in the Privacy law, COSATI's Panel on Legal Aspects of Information
Systems went on to prepare proposed policy guidelines to protect the
privacy of individuals, consistent with the government's need for
information. As written up by Paul Feldman for Arthur Miller's subpanel,
the Guidelines started with two simple rules:

The decision to demand information should only be made by the legislature;
never the exdcutive branch.

In all cases in which the legislature has not demanded information, the government may gather information from individuals only by request and with their informed consent.

The Guidelines covered two kinds of data:

Data gathered without mandatory authority for purposes other than to regulate or to establish identity or eligibility of individuals for administering benefit programs. These data could only be gathered from individuals with their informed consent. The types of data, the meaning of "informed" an "consent" were further explained in the text.

Data gathered for regulatory purposes or to establish the identity of eligibility of individuals wishing to participate in benefit programs. Data of this category will be held as confidential, unless the individual from whom it is gathered gives informed consent for disclosure or courts order the data to be disclosed.

When an individual has been promised data confidentiality, arrangements must be made to safeguard such data. If data are to be published and subjects have been promised confidentiality of study results, standard precautions will be taken to assure anonymity of subject individuals. If anonymity cannot be guaranteed, data will not be published without written consent of the subject individuals (220). It was gratifying to see that these guidelines were included in the spate of privacy laws and directives that came into being in the early 1970s.

(220) Feldman Paul, COSATI Panel on Legal Aspects of Information Systems, Proposed Privacy Guidelines, March 17, 1971, pp 3.

(221) Aines, Andrew A., OST, Memorandum to David Beckler, OST, Subject: Privacy Issue, March 18, 1971, pp 2.

(222 Miller, Arthur, Chairman, et al, Task Group on Privacy, COSATI Panel on Legal Aspects of Information Systems, Plan for a Study on Computers, Privacy and Freedom of Information, Included was a Report on Proposed Privacy Guidelines, March 15, 1971, pp 14.

During this period, the Farmakides Panel had prepared the long-awaited plan for a "Privacy" Report and Proposed Privacy Guidelines (222), I advised Dave Beckler in a memorandum (221) that we had invited David Martin, DHEW, an authority on privacy, to attend. The paper was also discussed with OMB's legal expert, Paul Kreuger, who agreed that OST should carry the ball and make recommendations to OMB for a possible directive on the subject. John Farmakides, chairman of the COSATI Panel on Legal Aspects, also agreed that the start of the Ervin hearings and increased media excitement warranted our going into higher gear. Farmakides' boss, the NSF general Counsel, agreed on the merits of a government-wide effort and agreed to and did make John Farmakides available. We contemplated setting up a small ad hoc group to seek further implementation, if the reading on the Miller Report turned out to be positive (221). At a meeting of Farmakides, David Martin and myself, we concluded that although the Farmakides' privacy plan was ready for COSATI-FCST attention, we should form a small ad hoc group to sharpen our

recommendations on the protection of privacy (223). Interestingly, it was OST, not OMB, in those days that was playing a lead role in the privacy area. The latter group was simply not organized to make a serious study of its own.

The Miller Report Plan is worth a brief dewcription. It was to be divided into four chapters:

Chapter I -- Privacy: Social and Legal Aspects. Sub-sections included: Privacy and Dignity, Notions of Privacy, Measures of Privacy, and the Legal Status of Privacy and Freedom of Information.

Chapter II -- Information and Information Systems. Sub-sections included: Existing Practices and Policy Problems of Some Information Systems and Classifying Information Systems.

Chapter III -- Computers and Information Systems. Its sub-sections included: How Computers May Become a Nuisance, Financial and Technical Feasibility of Computerized Information Systems, and Security Pr9oblewms in Computerized Information Systems.

Chapter IV -- Proposals for Action. Sub-sections included: A right of Privacy, Curbing Misuse and Abuse of Information Systems, Vehicles for Action, Legislative Competence, International Considerations, and a Conclusion.

The essence of the Guidelines is shown in Paul Feldman's summary (220) above, but this encapsulation does not reveal the richness in the Proposed Privacy Guidelines, which, I believe, became a useful input in the work of Congress and other efforts by groups studying privacy outside of Congress. After yet another review of the Guidelines, it was agreed that changes should be made that would make it tighter, more goal-directed, and polished and stylized. We wondered how to get the document to the agencies for their guidance. OMB's Taeuber and I agreed that the President should send it to the Federal agencies with a cover letter asking agency heads to give it high priority. It was also suggested that it be given to Senator Sam Ervin who had become deeply involved in privacy matters (227).

(223) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Review of the Week/An Idea or Two, March 20, 1971, pp 5.

OST and COSATI

It was an interesting week in March. We discovered that President Nixon had included in his Report to Congress: United States Foreign Policy for the 1970's, a statement that we enjoyed. He advocated that the country "take the leadership in encouraging the exchange of scientific and technical information" as a national initiative. I wrote to Dr. David:

I am delighted to see the President's statement, one that virtually all recent Presidents have endorsed. I hope that during this administration we will be able to fulfil his promise with a number of "center ring"

programs. Sharing of S&T knowledge among countries is a policy that helps
shape the future and unites people everyhwhere. I find that there are many
people all around the world getting excited about the prospect of
international sharing of STI by means of teleprocessing, hence the
President's words will be well received.

The lack of response from Dr. David revealed what I first thought then was
an absence of enthusiasm for such a project, but this was tempered by the
recognition that Dr. David was beginning to have trouble with the
President who was angered by the "infractious scientists" who were part of
the White House science advisory mechanism (223).

Congress

Not enough can be said of about the determination of Congress to upgrade
its own information processes. More about Congress'plan to achieve this
goal was revealed in a presentation to COSATI by Robert Chartrand and
Walter Kravitz, both of the Congressional Research Service. CRS itself was
scheduled to increase its staff from about 300 to 1,000 persons. This
would improve CRS ability as an information and evaluation arm to serve
Congress. The planned third building of the Library of Congress, which was
estimated to cost $95 million, was intended to house the new LC computer
complex. The beautiful Madison Building eventually was built and the
front office, including the Librarian, his staff, and CRS moved to the new
building (223).

GAO amd Federal Dissemination of STI

GAO during the early part of 1971 was making a study of the Federal STI
dissemination program. It focused its attention on NTIS and the
disseminating Federal agencies. Richard
Smith of that organization asked me for a copy of the Downie
(COSATI) Report on Dissemination of Technical Reports. I agreed to the
release, of course, but made it clear to Smith that a study of NTIS and
the agency dissemination programs would be incomplete without studying
what was being done in this area by the Superintendant of Documents, a
congressional group. There was no evidence that Mr. Smith succeeded in
convincing his agency to make the add-on (223).

DOD and Technology Utilization

During the first quarter of 1971, the General Accounting Office was
engaged in a study of DOD's technology transfer efforts to determine the
extent of "spin off" to the other agencies and to the private sector. The
DOD technical information chief, Walter Christensen, complained that DOD
had no legal requirements to engage in technology transfer and that the
GAO study team was not qualified to make the determination. I informed him
that there was no reason under the sun why DOD should not institute a
positive technology transfer program. There were many people within the
DOD R&E
structure who agreed that the value of the DOD R&D program would increase
to the country even with a nominal technology transfer program. I
suggested to Dr. David that this might be made into an issue that he could
discuss with the Director of DOD R&E, Dr. John Foster. All it would take

would be a couple of people to operate the program. The need for additional funds for the purpose would be very small and the value of the program very large. I stated my readiness to prepare a memorandum from Dr. David to Dr. Foster, but the signal never came (223).

Improving EOP Information Processes

Robert Barlow, OST, informed me that a new Legislative Tracking System has been decreed, whereupon I wrote to Dr. David:

I think that this is a real step forward, if the effort does not become a ritualistic exercise to collect data that will not be properly used and exploited in the Executive Office of the President. If it works well, it could usher in other data programs that will help us all do our jobs better. For example, Congress' Senator McClellan is pushing S.718, which if passed, would create a catalog of Federal Assistance Programs. Advice was given by me to the OMB Legislative Reference to approve this measure as a desirable step forward.

I also used this opportunity to state:

It is my hope that the Director of OMB, Mr. Charles Schultz will commence hiring people who are familiar with electronic data processing. We could also use a few people in the OMB science examiners shop similarly trained.

I did not expect that Dr. David would pick up the cudgel for this mini-crusade and he did not (223).

International

After becoming acquainted with the Japanese White Paper on the Information Age requirements, I became intensely interested in the need to watch what was happening in Nippon. I ran across a paper prepared in Japan by the Ministry of International Trade and Industry (MITI), entitled "Outline of Examination of Actual Data Processing Condition for the Year of 1969." I shared a copy of the outline with Dr. Ruth M. Davis, Director for the Center for Computer Sciences and Technology, National Bureau of Standards, who wrote me:

The statistics cited in the paper were somewhat outdated, she stated, but she conceded that it underscored the rapid thrust of computers in Japan. She provided additional statistics that demonstrated that:

Japan was now second to the United States in the manufacture of computers, an amazing feat, considering that it was only in 1956 that Japan's Electrotechnical Laboratory had completed its first computer (Nark III).

Of the 6,700 computers in operation in Japan in early 1971, 70 percent were produced in that country.

Of the seven major computer makers in Japan, five already had affiliations with U.S. companies. IBM has patent license arrangements with six of them. The Japanese government provided considerable capital and other support to

the Japanese firms, as well. The seven corporations formed the Japanese Electric Computer Company in 1961 as a computer rental company.

Data banksin the public sector were accumulating in such categories as: labor, economics, STI, crime, transport, medical welfare and finance.

Dr. Davis also reported that there were many Japanese visiting groups in the United States in 1968 and 1960 to receive instructions and training for periods up to three weeks from software houses, non-profit organizations, manufacturers, universities, and government organizations, the National Library of Medicine and the National Bureau of Standards included. She added that although there was representation from Japanese government and research organizations, most of the visitors came from banks, electric and chemical companies, insurance companies and electronics and camera firms. Visitors told her that there was a strong effort in Japan to educate the general public on computers and their applications, including guided tours and tourist interactions with computers via computer terminals. She added:

Japan now appears to be trying hard to obtain a larger share of the foreign market. Mitigating somewhat against their progress is their small amount of research and development expenditures--apparently for reasons of economy--but it looks like the United States will need to continue to take a close look at their aggressive competition in the world computer markets (224)

(224) Davis, Ruth M., Director, Center for Computer Sciences and Technology, Department of Commerce, Memorandum to Andrew A. Aines, OST, Subject: Material from the Ministry of International Trade and Industry, Japan, entitled "Outline of Examination of Actual Data Processing Condition for the Year 1969", March 10, 1971, pp 2.

It was quite evident that too little attention was paid in the early 1970s to the views of Dr. Davis and myself (along with others) about the emergence of the Japanese as a strong competitor to the United States. This does not mean that we as a nation could have done anything to change what has happened, but, questions remain. The Japanese are to be admired in learning at first hand within the United States knowledge that it has exploited brilliantly. They are further admired for taking advantage of the open American university system to obtain scientific and technological information as students at eminent U.S. technical universities, graduate and undergraduate, in the mid- and late-1980s. Ironically, the American government, which has lamented the "hemorrhaging of U.S. technical know-how" during the last half of the 1980 decade, has been silent about the one-way passage of technical information to foreign countries through our universities. The latter would probably protest that only open scientific knowledge has been made aavailable through their educational programs. It is probably closer to the truth to wonder if they have allowed some foreign students to obtain some access to restricted knowledge because of the lack of abolute security in their laboratories and the free speech atmosphere that exists in universities; an increasing willingness to provide privileged STI to foreign governments that subsidize some universities with research and operating funds; an interesting antagonism to the Federal establishment in spite of the huge amount of dollars that

flow to the universities from the U.S. government, thus a self-proclaimed and administered justification for non-withholding of access to the foreign students; and finally providing foreign students with much greater knowledge of how to access technical knowledge through fellow students and the formal technical information channels in the United States than we can possibly obtain overseas

(225) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Technological Initiatives, March 25, 1971, pp 2.

Responding to an invitation from Dr. David to suggest technological initiatives that the President might want
to announce, we offered a few candidates:

A program to be undertaken by the Science Advisor and the Director of the Office of Telecomunications Policy to improve the data processing systems of the Executive Branch. This program would also help absorb a number of computer-communication experts made available by cutbacks in aerospace and defense programs.

A technology utilization program, sparked by new enabling legislation, to make fuller use of the large bank of unexploited knowledge which has resulted from governmental research and development.

A information program to improve our environmental quality crusade, a program that should additionally be pushed as the nucleus of an international environmental
early warning system.

Advocacy of a intergovernmental effort to establish a new and unique all-government information network that would more closely bind together the 80,000 or so units of government operating at all levels in the United States for the sharing of all categories of information. The purpose would be to streamline governments, expedite information flow, and reduce the growing cost of governmence in the United States.

Finally, the document called on the President to acknowledge the arrival of the Information Age. It urged him to announce that:

We are entering an era that will be characterized by a sharp shift in the way knowledge is being handled. When the computer is linked to other break-throughs in information and communications technology that are rapidly flowing fron laboratories, it is not difficult to see that we are being ushered into a new world. Great industries are being born; people are just learning how to use the technologies; and we can now handle and transmit knowledge, unlike any previous generation, to improve man's lot (225).

As a scientist, I am certain that Dr. David needed no advice from me on the realities and the portent of the Information Revolution, but I had no assurance that any of the above recommendations were actually transmitted to President Nixon. More than a decade and a half later, such a presidential statement has not yet been transmitted to the American people

to the best of my knowledge; this was and isis a grievous oversight, as I see it.

(226) David, Edward E., Director, OST, Letter to Senator John L. McClellan, Chairman, Committee on Government Operations, U.S.Senate, Subject: David's Views on S. 718, a Bill to Create a Catalog of Federal Assistance Programs, March 22, 1971, l page, (S.718 was attached.)

Congress

Congressional hunger for information for itself and its constituents, information that resided in the Executive Branch, continued unabated. This is seen in a bill - S.718 - that appeared in the Senate. The purpose of S.718, which was also called the Program Information Act by its sponsors, was to create an information system in the Executive Branch that would assist those who were interested in domestic assistance programs to identify all existing Federal programs in this domain. The Bill called for a catalog of domestic assistance programs that would be submitted to Congress by the President annually. A detailed index that would make searching easier for inquirers would also be required by the Bill, if inacted. All kinds of Federal assistance program information, possibly including R&D, but excluding national security and public affairs information, would potentially have to be included. Mentioned specifically were such data holdings as: grants, loans, loan guarantees, scholarships, mortgage loans and insurance, statistical and other expert information. Pinning down members and staff of the Senate Committee on Government Operations to determine if R&D data were included was far from easy. It was believed in OST that the invitation to participate stemmed from the recognition in Congress that it was OST and COSATI who were then regarded as the prime movers for better information systems in the Executive Branch. Dr. David wrote in his response to Senator McClellan:

I agree with the value of a Federal assistance program catalog. But while I can see no unsurmountable obstacle, I am unable to assess the extent and shape of user needs, nor can I predict the volume of traffic between the file and its users. This knowledge is importent since it would influence the size and shape of the information operation that would be required. Support of the operation center would be costly and so would be the gathering and updating of the assistance data. Thus, I come down on the side of a preliminary feasibility study, including a cost-benefit analysis study, to assure the success of the effort (226).

(227) Aines, Andrew A., OST, Memorandum to David Z. Beckler, OST, Subject: COSATI Paper on Privacy, 25 March 1971, l page. See 222, above.

COSATI and NSF

During the month of March 1971, Dr. Edward David and Dr. William McElroy, Director of NSF, privately discussed STI matters, including the future sponsorship of COSATI. I was not invited to participate for reasons that were never explained. Trying to reconstruct what was happening, I was informed from sources outside of OST that the NSF Science Information Council had come up with a recommendation to Dr. McElroy that COSATI

leadership be turned over to NSF. To this day, I do not know if SIC was the initiator of the proposal or if it was directed to write it. Time passed before the information trickled down to me. I was unofficially given a copy of the letter from Dr. McElroy to Dr. David by a sympathetic third party (228).

A summary of the McElroy letter follows:

The Foundation is prepared to accept the chairmanship of COSATI, provide strong leadership for it, and with OMB approval to provide necessary personnel and funding to carry out its responsibilities.

COSATI can become a more effective coordination mechanism with the following actions:

Redirection of COSATI activities

An organizational structure keyed to specific goals and objectives

A defined program plan that would permit review and evaluation of COSATGI activities

Active participation and cooperation of the STI community

Leadership which in an operational sense can bridge between the government and non-government sectors.

(228) McElroy, William D., Director, NSF, Letter to Dr. Edward E. David, OST, a Proposal to OST that COSATI be Turned Over to NSF, March 26, 1971, l page. The cover letter had attached to it another document with the title: Program and Justification for Revised Organization and Operation of COSATI, dated March 17, 1871, pp 5, (Authors unknown).

Following are extracts from the document entitled: Program and Justification for Revised Organization and Operation of COSATI:

COSATI is engaged with a large number of problems, thus it fragments its efforts and tends to accent information exchange, rather than acting as an advisory and catalytic mechanism for FCST, OST, OMB, and the agencies. COSATI should concentrate on critical problems of the Federal and non-Federal STI community and engage in more effective coordination of the two sectors. There is some overlap of services between the two sectors. Unneccesary duplication of processing costs is driving many of the private sector systems into insolvency. R&D benchworkers are frustrated by the overlapping services, each with a different approach. COSATI should be organized to provide leadership in the coherent development of a nation-wide network of information systems and services for science and technology. COSATI's meetings should be organized to reach decisions or provide recommendations to policies and action programs. Formal presentations (stewardship reviews) have been useful but time-consuming. Information exchange among the agencies and private sector groups are useful, but alternate mechanisms should be established for this purpose. The COSATI charter does not need to be changed.

NSF has supported the development of information systems to serve the basic scientific and engineering disciplines as directed by the National Defense Education Act of 1958, Title IX. This course of action was agreed upon by Drs. Hornig and Haworth in 1964. (Their agreement also made it clear that COSATI would be responsible for the coordination and development of the Federal agency programs. OST would maintain staff responsibility over NSF's STI activities.)

The document called for a re-ordering of COSATI's functions along these lines:

Providing leadership in both the public and the private sectors leading to nationwide network of information systems. Formulation of information system concepts, development strategies and funding plans on a national basis. Development of statistical information for management purposes covering both the public and private sectors. Development of a spectrum of Federal STI policies for international activities (information interchange, international activities, and exploitation of foreign STI). Development of a registry of Federal computer programs.

There would be a reorganization of COSATI's panels and task groups into five task groups: networks, science information research, international activities, government-wide project-reporting system, and funds and statistics. A small, but active, supporting staff would be made available to the COSATI chairman, who would in the future be the head of OSIS' program. Four new staff positions and an increase of $500,000 would be sought, and, after a period of one-year, there would be a rigorous review to assess the success of the program (228).

After reading these documents, I was perplexed. The faults attributed to COSATI were greatly over-drawn. Some of the specific recommendations for COSATI improvement had already been launched weeks and months earlier. These changes were conveniently overlooked. At no time had my colleagues at the National Science Foundation and probably OMB, who were involved in the preparation of the bill of particulars, officially touched base with me. Conviction began to grow that early on Dr. David had made a decision to oust the STI program from his office and that he was searching for a way to accomplish it. Dr. David was evidently unaware that the Federal STI coordination program was at first attempted by NSF in the early 1960s. After a period of frustration, Dr. Burton Atkinson told OST that he could not command action or obtain cooperation from the other Federal agencies. He felt that since he did not have the necessary clout, transferring the COSATI function to OST was the proper course of action.   This could have been explained to Dr. David had he asked.

Expecting that he would call me to his office to explain his decision, I prepared my defense. A few of the highlights of my paper are listed below (229):

The assumption was being made that the officials of COSATI somehow possessed more directive power to force Federal agency action than we actually had.

FCST, our parent organization, was having its own difficulties with some of its members, but we in COSATI, on the other hand, believed that our committee effort was more vigorous and successful than what was evident and accomplished by other FCST panels.

There was no recognition of the additional work being done by OST staff, which were outside of our COSATI efforts.   .

A meeting was held with Dr.McElroy, freshly arrived in his post. I asked him for personnel and financial help for OST and COSATI. I pointed out to him that no NSF STI personnel had been made available as chair persons or members of COSATI panels for several years, a practice that was resented by other members of COSATI, who had been cooperative. The personnel were not forthcoming for OST detail, nor was there a change in the NSF policy vis-a-vis NSF service on COSATI panels or task groups. It made little sense to me for Dr. David to turn COSATI over to NSF with this record.

Non-working or ineffective COSATI panels and task groups had been phased out. We had recommended the merging of NTIS, the Science Information Exchange and the National Referral Center. There was a constant flow of studies, reports and recommendation for improvement of Federal and national STI programs. We have sought to apply pressure on government agencies to implement the recommendations made in a number of studies (SATCOM, COSATI, Congress, PSAC and others).

Special efforts have been made by COSATI and OST in such areas such as: an international conference on engineering information and data, new techniques of science publication, environmental quality, library programs, information analysis centers, information dissemination guidelines, microfiche standards, privacy and legal aspects of information systems, copyright law, input to computer-based information systems, technology utilization, Federal chemical information and data systems, marketing and user charges, STI annual accounting for Federal STI programs, inventory of agency mechanized information systems, international recognition of the work of COSATI, the role of the technical report in science and engineering communications, bibliography on the management of information systems and programs, and project to popularize the work of the STI task group of NAS-NAE SATCOM. A special study was made on synoptic data by the representatives of the Space data Center, ESSA, NODC, etc. that resulted in a set of valuable recommendations. Training programs for scientists and information experts were prepared, including the preparation of a moving picture film dealing with Federal STI. We took steps to improve the relationships between the Library of Congress, the National Library of Medicine and the National Agricultural Library. They have also created joint programs in cataloguing, networks, and other joint programs. Cordial relationships have been forged with congressional committees. We assisted the Information Industry Association and the Council of Communications during their formative period. We sought to defuse the battle going on between some government agencies and private sector information disseminators. We helped the American Business Press, Inc. to form the Government-Business Scientific and Technical Information Committee (GOBSTIC) to coordinate better with the Federal Agencies. We briefed FCST members about the COSATI and OST STI programs, winning their

praise for our accomplishments. We contributed to the President's Networks for Knowledge project, chaired by Dr. Hornig.
We have prepared annual Federal STI progress reports and weekly reports to the Directors of OST. Many of the involvements and accomplishments of our office were recorded weekly and transmitted to the Directors of OST, as well. The reader will note that these weekly memoranda provided an excellent store of knowledge that were invaluable in writing this book. The call from the OST Director did not come, it is sad to report..

(229) Aines, Andrew A., OST, List of COSATI Accomplishments Prepared for the Director, OST, March 30, 1071, pp 8.

(230) Beckler, David Z., Assistant Director, OST, to Andrew A. Aines, OST, Subject: Communications, Information, Computer Section of the Annual Report, March 31, 1971, 1 page.

Dave Beckler was charged with the preparation and assembling of the long-awaited Annual Report on science and technology. I was the action officer for the section on communications, information and computers. I do not recall how many drafts I prepared, but there were a number of them. On this occasion, Dave Beckler was at least partially pleased. He wrote: "I think your latest version of the draft section is a great imnprovement. You may want to highlight in a more focused way the few major developments in these fields that have policy import, and indicate the kinds of policy implications that are emerging. I bowed my head and started yet another re-write of my section of the document. Despite the effort by David Z. Beckler and the OST staff, to the best of my knowledge, the national annual report on science and technology, which was originally called for by the Deputy Director of OMB, William Carey, and others, never saw the light of day. The reasons for this failure were never fully explained (230).

Federal Libraries

(231) Rees, Alan M., School of Library Service, Case Western Reserve University, Report on Interface of Technical Libraries with other Information Systems, Prepared in conjunction with the Federal Library Committee Task Force on the Role of Libraries in Information Systems. this effort was sponsored by the Office of Chief of Engineers, U.S. Army, TISA Report No.35, March 1971, pp 132.

In May 1964, the U.S. Army established the Army Technical Library Improvement Studies (ATLIS) as an approved part of the Army STINFO program with the objective of assisting in the development of dynamic, coordinated technical library operations to serve the scientific and technical activities of the Department of the Army. In June 1965, the responsibility for the technical direction of ATLIS was assigned to the Office of the Chief of Engineers. In 1969, ATLIS was reconstituted as the Technical Support Activities Project (TISA) to broaden the base to include all Army Technical Information Support Activities. This included experimentation with information techniques, the development of information procedures and the preparation of guidance documents for information activities. Technical information support activities included

technical information analysis centers, technical libraries, and technical infoirmation centers. The report states:

The feasibility of developing a network of each within its current resources is being explored. The importance of integrating all Army information support units into a network is emphasized. At the same time, it is planned that all work units will be coordinated with COSATI, Federal Library Committee, Office of Education and other organizations so that the Army's plans will mesh effectively with national networking activities.

The significance of this document is manifold, but it is mentioned here to show the interest of a Federal agency in working with COSATI. The report found, in general, that there was need for a concerted effort to integrate library and information programs to design a more efficient and effective information transfer system. To accomplish this, the author called for the establishment of a joint COSATI and Federal Library Committee working group to determine how to best integrate the systems, to recommend how evident duplication in the two systems could be minimized, and to recommend ways to avoid damage to the careers of individuals in the library sector. Dr. Rees also noted that early on librarians did not pay enough attention to the deep concern that top leaders in government had about the need for improved scientific and technical communication. He expressed the opinion that librarians did not sufficiently express their concerns to Congress, also that they seemingly accepted the notion that their programs were passive compared to those of the Federal STI community, who were adamant about the need for pro-active information processes. The author expressed considerably more respect for the prestige and value of the Federal Library Committee than it probably deserved during the time of the study. This was largely because the agency members of COSATI, with only a few exceptions, had little interest in working with the Federal Library Committee. FLC was considered by them to be dominated by legislative branch officials while they were part of the executive branch. He did accurately portray my views at the time of the study with the following observation:

Colonel Aines, Chairman of COSATI, pointed out that the library community or specific groups in it should be consulted to determine how they want to participate, or feel qualified to participate in development of, and participation in, national information programs. Consideration should be given to the presence and probable growth of non-library information activities in the determination of the library role.

We were in full agreement with the report in its conclusion that the possibility exists to design a more sophisticated, effective and economical information program than now exists in the fragmented and jumbled approach to information processing in Federal agencies (231). Unfortunately, support from higher authorities to seek a sounder Federal information program that would bring both communities together was not forthcoming. Thus in the late 1980s, the problem still remains unsolved.

Libraries and COSATI

(232) Harlow, Neal, NASA, Subject: Research Libraries and the Information Community, Presentation to attendees at the Second Federal Information Resources Conference, December 1970, pp 7.

Harlow was of the opinion that it is imprecise to talk about an American Information Community, instead there are several coexisting, but often competitive programs: government agencies with their missions, the communications industry (publishers, research organizations, and equipment manufacturers all operating under the profit motive), professional societies, universities, and libraries in all of these fields which focus on customer services. Another (and simpler) cross-section of the field is made up of the public and the private information sectors. To become a coherent information community, it is necessary to identify the interests that all hold in common and find some way to bring all of these groups together, otherwide there will be a lack of coordination and counterproductivity will continue to rule. The library groups would be wise to recognize that they have lacked cohesion of the type that has been acconplished by COSATI in the Federal government. To hold there own, a parallel group should be established by the research librarians. He pointed out that COSATI had formed a Task Group on Library Programs, which unexpectedly encouraged joint action with the library community. COSATI had openly informed librarians what its goals and objectives were, but the latter group responded, not in kind, but by discussing mostly its "visceral needs for catalog cards, bibliographies, publications and funds, also about the government's failure to serve the nation through the research libraries." He advocated a course of action that would encourage the Association of Research Libraries to play a leadership role in the overall linking process. Dr. Harlow concluded his presentation as follows:

The responsibility of the proposed Task Group will need to be clearly stated at the start and the crucial character of its business emphasized in order that people competent for the uncommon task will be appointed. By means such as this some of the most basic problems of the library and information community can be directly confronted, a group with jurisdiction and influence can speak for the research libraries, and fundamental action will be taken to turn limited and partisan interests into a national program to benefit all of information users (232}.

It was evident that Harlow recognized the need for better bridges between all groups providing library and information services as a first principle. The need has not materially changed almost two decades later.

Technology Transfer

In 1971, we were still unhappy that we were unable to accelerate the process of technology transfer, especially from the public sector, which was producing mountains of new STI, to corporations and others in the private sector. We recognized with mounting evidence that the process was infinitely more complicated than mere announcement and delivery of Federal STI to the private sector. It seemed to me that the scientific and technical leadership in the Federal government did not do enough to give technology transfer the high priority that it deserved during the 1960s and 1970s. But, then again, there was hardly more than lip service given to the need for increased productivity and competitiveness during that

period. Concerned about the lack, I prepared an internal memorandum for the record to showcase the problem (233). Here are a few observations:

The ever-growing population in the United States dictates that we will need more jobs in the future.
To maintain national prosperity, we will have to successfully compete on the world market, thus the need for greater productivity. This means that we will have to introduce more time and labor-saving devices into our farms and factory operation. With greater automation in these fields, it is probable that we will be able to do the work with fewer workers. This translates to the requirement that our manufacturing and services sectors will have to absorb the annual inflow of new workers. It is evident that we really have a mixed economy today and that the marketplace mechanism, no matter how we would wish it to succeed, may not alone provide the jobs when needed.
It may very well mean that from time to time we may need new programs and techniques to absorb the work force. In a sense, this is what the abortive State Technical Service program in the Department of Commerce sought to do, but it was under-funded, poorly supported, poorly understood and poorly led. Getting more mileage from the huge STI resource produced by or for the government still remains a high priority. Thus, we still need a new governmental-industrial task group to explore, find, and exploit more diligently the Federal STI treasure trove. Perhaps we need new legislation to require each of the Federal R&D agencies to participate in a more positive technology transfer program; this along with a reward-penalty system that will make it financially rewarding for government workers and executives to help spark the technology transfer program (233).

Although more attention is still required, it should be noted that in the mid-1980s, as a result of actions in both the Congress and the Administration, steps are being taken, although inadequate, to solve this problem. But, in all fairness, even though the harvest of technology transfer has been meagre, there have been a number of instances of transfer of new products and processes invented during the 1960s and early 1070s that can be reported. One informal DOD study revealed the following list:

Molded soles for shoes
Dehydrated fruits and cereals
Prosthetics
Reinforced plastics for packaging   Antidote for heavy metal poisoning
Aerosol industry
Mass innoculation device (air pressure)
Automated survey devices (geodometer,
          automated altimeter, etc. used for
          mapping)
Infrared microscope
Fire-retardant paints
Self-contained fire extinguishers for
          aircraft use
Undercoating for automobiles
Weldable titanium alloys

Welding technology for high strength steels
Insulated rubber footware
More durable shoe insoles
Solid chemical fuels
New road building methods and soil
    stabilization
Ground mobility - NASA lunar program
Vaccines: typhus, malaria, encepholitis
Plastic sprays instant seal for blisters
Shatter-proof windows
Sensors for medicine: IR, electronic
Civilian aircraft design (DC10s and 747s)
Helicopter designs
Fog dispersion at airports
Airborne infrared detection to spot
    pollution

(233) Aines, Andrew A., OST, Internal Memorandum, April 2,1971, pp 3.

(234) Aines, Andrew A., OST, Memorandum to Dr. Edward E.David, Director, OST, Subject: A Few Highlights of the Week, April 10, 1987, pp 2.

Technology Transfer

One of the members of Congress, Congressman Edward Roush, was adamant in his view that much more needed to be done to inprove the use of government STI for technology transfer. As early as 1970 he was toying with the notion of launching a bill that would accelerate action. At his request I met with the congressman and a member of his staff, Dr. John O'Callaghan, to discuss the subject. We discussed the defunct State Technical Services Act and what a blow it was to the states and technology transfer when this pioneering act was scrapped. I pointed out to him that much of the responsibility for the scuttling could be laid at the feet of the Congress. He agreed. With the passage of time, nothing concrete happened from Mr. Roush's effort, I regret to state. Congress and the Executive Branch were simply cold to the notion of a sustained aggressive technology transfer program in the early 1970s.

COSATI

Interviews with Dr. William H. Mitchell, Chairman, HUD's Urban Information Systems Interagency Committee, Dr. Stanley Greenfield, EPA, and a Navy STI team during an OST Stewardship Review, led me to believe that HUD, EPA, and the Navy were not making very much progress in improving their STI programs. The problem of funds contributed to the weaknesses of the three agencies, but most of the difficulties they were encountering dealt with the real lack of agency understanding and resolve on the part of the leaders of these three agencies to create a respectable program (234).

Information System for Pharmacists

The departure of Paul Olejar, one of the key persons in the Army Technical Information Program that I led years earlier, and who later had been responsible for the Federal Chemical Information Program at NSF, while in

the U.S. government, was a blow, but his next post was at the University
of North Carolina. While there, he planned a program to establish an
information for pharmacists. He and Fred Eckel of UNC visited with me to
tell me about their plans. I felt that his effort was a form of technology
transfer, less to transfer Federal STI, and more to use the knowledge he
gained in establishing information systems to a university setting (234)

Information for Consumers

During the early 1970s, Virginia Knauer was the White House special
assistant for consumer affairs. Harry Wells and Timothy Burr of her office
met with me to discuss the OST-COSATI STI program, as well as discuss what
their office was doing in the information area. Mrs. Knauer has given a
contract to the Army Natick Laboratories find ways of making government
technical information obtained during procurement programs of the agencies
more available and useful. They also discussed what GSA was doing on its
own and at the request of the White House to make information about
products purchased by GSA and other agencies available to the public. They
asked to be kept informed about COSATI and its programs (234).

DOD and NTIS

From time to time, I was asked to act as a mediator between agencies that
had disagreements about jurisdiction. One that brought me into the picture
was an argument between William T. Knox, Director of NTIS, and Walter
Christensen,
Director of Defense Technical Information. In this instance, Knox
complained that DOD was trying to move in on NTIS's micrographic program.
Prior to providing them with guidance, I held a meeting with George
Bernstein and Norton Goodwin,m two experts on microgaphic technology and
and its applications. After a couple of discussions with Knox and
Christensen, I found that they had come to an agreement on jurisdiction
(234)

Latin-America

The AID-OAS-Battelle Memorial technical information program was still
moving along during early 1971. I met with the OAS ccordinating committee
to find out what progress it had made and to provide them with advice and
guidance. They informed me that the Soviets had asked for OAS advice in
working with Latin American countries on technical information-sharing
programs. Dr. Halty of OAS informed me that the Soviets were
particularly interested in the project and of OST's involvement in it.
Oleg Mikhailov, a Soviet national in charge of the UNESCO STI program, was
planning to meet with me in a fortnight and I assumed that he wanted to
discuss what our plans were in Latin America among other subjects (234).

FCST

Consideration was being given by FCST to the establishment of a new
commnittee on automation opportunities.Asked for my opinion about such a
move, I told the FCST executive secretary that I was generally favorable
to such a development (234) as long as it did not duplicate what we were
doing in COSATI.

NAS Computer Panel

The NAS panel on computers was still having problems with the NAS
leadership, I learned from Warren House, the executive secretary of the
panel. These were discussed with me. I took advantage of the opportunity
to put in a plug for the inclusion of STI programs in the panel's work
agenda in the future. More specifically, I called on House to consider
expanding the work of the Oettinger Panel to include other information
technologies and the purposive use of information and data for real-life
problem solution (234).

National Science Foundation

During early 1971, the Congress and the science community outside of
government were very critical about the National Science Foundationl. Dr.
David invited his staff to make recommendations about NSF to lift its
credibility with its detractors. I respomded with these suggestions:

1. A quick study should be made about the strength of the critics and
their criticism, i.e., will the tempest blow itself out without taking
further action?

2. Steps should be taken to encourage the formation of an independent
coalition of groups outside of the government that would take up the
defense of NSF and government R&D, which was also under attack. The help
of the universities, the major publishers, and friendly professional and
trade groups should be solicited by the national academies of science and
engineering. Consideration should be given to enlist the media to
participate. The basis for the appeal should deal with generating and
protecting the free flow of knowledge.

3. Word should float back to critics, at least those that were not "hard
core" ones, that the barrage of criticism had a chilling effect on NSF's
productivity and this kind of chilling needs to be prevented or minimized.

4. Careful steps should be taken to insulate OST and NSF from being
regarded as the source of a concerted effort to silence legitimate
criticism, which we should really want to flow freely.

Fortunately, the anti-NSF crusade turned out to be less than a powerful,
concerted assault and the subject was ultimately dropped. Its lack of
success can be recognized from the fact that the NSF budget has continued
to increase spectacularly over the years (235).

(236) Aines, Andrew A., Memorandum to Lawrence Goldmuntz, Executive
Secretary, FCST, Subject: OST-COSATI Projects and Issues, April 12, 1971,
pp 11.

In a discussion with Larry Goldmuntz, he suggested that it would be
valuable for him to be provided with information dealing with issues
dealing with information, computers and communications. I recognized that
it would be useful to him, since he was not aware of the contents of the
flow of information to the Science Advisers and others since 1964. It was

also apparent that he was much more familiar with the world of computers and their use in the private sector, coming from industry, than his predecessor. In a word, I considered his request as very serious and worthy of the best answers that I could provide.

1. More efficient national and international STI networks and databases are a goal for all countries involved in substantial R&D programs. This is one way to reduce unnecessary duplication, overlap and gaps in R&D that can conserve R&D dollars. It will also make for more efficient use of new and costly information technology. FCST has already asked OST to take steps to organize a national system of STI systems. Individual Federal agencies will become "responsible agents" for information systems in their own mission fields. Six agencies have already volunteered (NASA, AEC, USDA, Interior (natural resources), DHEW (biomedicine), and the Office of Education (educational). A seventh agency, NSF, has indicated willingness to monitor discipline-based information systems (physics and chemistry). Discussions were held with DOD about it becoming the responsible agent for engineering information systems. The specific discipline information systems would be operated by professional societies as "delegated agents" of NSF and DOD. The advantages of this program are: it will obviate the need of a monolithic information system feared by most organizations; it will avoid establishment of an expensive overhead; significantly improve cooperation between the public and the private sectors; facilitate the structuring of coherent international STI systems; and promote the Presidential policy of improved international exchange of STI.

2. A second area involves the improved interchange of Federal STI and information about proposed or new R&D work projects. This project is supported by the inherent goals of FCST. Studies undertaken by and for OST have shown that a common government-wide research project-reporting system is feasible. The operation of such a system would require only a small overhead, but would ensure necessary information flow. The program would be augmented by a government-wide technical report- sharing system that would operate almost automatically, i.e., through agreements to forward completed technical reports to other agencies involved in similar R&D automatically. Individual FCST committees and task groups, working in specific areas, could use the common system or add other information and data flow requirements as they see fit. The development of this interagency program would eliminate the present hit-or-miss approach that has been criticized by Congress and others. The program could also be used to encourage the prepaation of higher quality technical reports, as recommended by the COSATI Panel on Dissemination of Information, led by USAF's Colonel Currie S. Downie.

3. For several years, there has been criticism of the Federal government by the media, members of Congress and others about the government's encroachment on the privacy of individuals by dint of creating databases and potentially sharing information about them. The "Orwellian" horoscope was being cast, almost shamelessly, in congressional hearings. Senator Irwin became famous with the help of the media as a battler to preserve privacy. While intelligence groups received the most negative attention, it was the feeling of many of us that the work of scientists in creating improved information systems employing newer information technology could be inhibited. Quite independently, COSATI formed a Panel on Legal Aspects

of Information Systems to look at a number of troubling areas such as
copyright, patent law, international sharing, and computerized databases.
A subpanel of the group that was made up of reputable lawyers and
scientists, for the most part, was specifically interested in preparing a
think paper on the subject of privacy from the standpoint of government
science and technology. The leader of that effort was Professor Arthur
Miller, who was a member of the overall panel. The objective was to
prepare guidelines for the Federal agencies. The question remaining is how
to distribute the paper to the agencies. At the time, we thought that
informal distribution would be the best approach. What we have to think
through now is what other actions should be undertaken by OST and COSATI.
Unofficially, the paper was made available only as a think paper to those
in Congress who were determining what laws were needed in this area.

Other issues and projects covered in the paper: the health of scientific
publications and the page charge device (Dr. Edward Brady's task group);
determining the annual cost of Federal STI (Peppino Vlannes' task group);
OST international STI initiatives (convincing OECD to establish a
committee on information, computers and communications); (participation iu
the establishment of the UNESCO UNISIST global STI program); (U.S.-
Canadian conferences on information, computing and communications);
(organization of bilateral workshops with countries such as Mexico, Spain,
Italy, Germany, Eire, Israel, Korea, Yugoslavia, Belgium, France and the
Soviet Union); (improved interaction with the Council of Europe STI
efforts); (further development of the program of the COSATI Panel on
International Information Systems); OST reccomendations on micromedia
development (George Bernstein's ad hoc group; the need for improvements in
the management of agency Federal STI programs; and the improved
government-wide environmental quality information program (Dr. Henry
Kissman's SEQUIP committee.

(236) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director,
OST, Subject: Intelligence - Commentary, April 18, 1971, pp 3.

As a governmental official, I was upset by the many criticisms of
government information practices that appeared in newspapers, magazines,
and television . Most of these dealt with potential abuses, rather than
real cases. It was readily admitted that from time to time instances could
be found of the invasion of privacy by an individual or two in some
agencies, but this was far from the picture being painted by the media of
a corps of villainous, conspiring government officials, determined to
invade the privacy of innocent citizens for devious reasons. I did not
agree with the apparent policy of the Executive Branch to remain silent in
the face of the barrage of slurs. On the other hand, it was my view,
expressed to the Director of OST, that any government person found guilty
of deliberate efforts to invade the privacy of others should be punished.
I argued that mistakes could be made by supervisors, workers, and
computers, but these errors ought to be quickly rectified and not be
blown out of proportion. The Federal government was simply not the
"dossier society" we were often made out to be by critics. Fewer attacks
were being made on state and local governments than the Federal
government, even though the potential for cases of invasion of privacy
seemed to be higher or just as high at these levels. Virtually nothing was
being said by the critics during the 1960s and early 1970s about the

plunge of newspapers into computerized information systems, greatly
magnifying their ability to keep tabs on individuals over long periods. I
expressed the personal view that the remorseless competition between and
among the press and the electronic media for readership and revenue
probably would contribute more to the invasion of privacy of individuals
than anything that the government was doing. It was my steadfast view that
the three major branches of the Federal government - each watching the
others - would not permit us to slip into the feared "Big Brother" society
more in keeping with dictatorships (237).

In the years that have passed since I made my statement of belief in the
decency and probity of the Federal government to Dr. David, I have seen
the same kind of attacks being leveled at the Federal government in the
press quoting individuals who cite occasional cases of abuses. I believe
that these will continue to happen, but they should not stop us from using
new information technology to improve the operations of the U.S.
Government. Safeguards, yes, abandonment of the effort to upgrade national
information programs, no.

(238) Aines, Andrew A. OST, Memorandum for Dr. Edward E. David, Director,
OST, (through David Beckler, OST), Subject: National Library of the
History of Science, April 20, 1971, l page.

(239) Meadow, Charles T., OST, Memorandum to Andrew A. Aines, OST,
Subject: Summary of L'Affair Barchas, April 16, 1971, pp 2.

One of the interesting diversions that occupied our attention during the
early months of 1971 was what Charles Meadow dubbed L'Affair Barchas.
Meadow wrote in his memorandum: "Samuel I. Barchas is a private collector
who wanted to donate his extensive and highly valuable science book
collection to the United States to form the foundation for a new National
Library of the History of Science. To this end he contacted OST in the
hope that Dr. David would become interested." Meadow proceeed to
investigate the offer, including a discussion of its merits with the
Smithsonian Institution. The collection was reviewed by Smithsonian
officials, including Ripley, Blitzer, and Boorstin. Barchas was pleased
with the reception and gave up his original insistence on a National
Library. Smithsonian Institution offered a library in the Museum of
History and Technology that would be constructed to house the Barchas
collection and similar books. Barchas, according to Meadow, stipulated
that he and his wife be associated with the collection and its extension,
a request that met no objection. Barchas agreed to deliver the books
immediately. SI agreed to hire a professional appraiser to estimate the
dollar value. SI also proposed to learn more about the generous Barchas
family. It was estimated that the cost of the project would be about $4
million at the outset and a few hundred thousand dollars annually for book
acquisition and a skilled curator (239).

In my cover letter, I voiced agreement with the arrangement that had been
worked out and suggested that OST support the program as a prestige
project (238).

 check what happened.

OST

Not enough can be said of the favorable circumstances, the good fortune,
of having both Congress and the White House simultaneously interested in
Federal STI improvement during the 1950s. This book could not have been
written witbout what now appears to be this one-time opportunity. The
cooperation between the two branches of the Federal government that made
it possible to move the country into the Information Age, insofar as
science communications is concerned, disappeared as we entered the 1970s.
Fortunately, we had made substantial progress and in one sense, we are in
the 1980s still using as capital the momentum we had generated earlier.

There also was another positive accomplishment reached in the 1960s, not
generally recognized. This was the status of the small STI staff in the
Office of Science and Technology. Like all of our OST associates, we were
technical assistants to the President's Science Advisor. In this capacity,
we were expected to perform as a team, although each of us had a specialty
for which we were responsible. This meant that we were invited to make
observations and recommendations on all OST programs and issues, a task
none of us took lightly.
It is therefore reasonable to assert that the STI community
had reached a prestige never before achieved during the 1960s and never
since. Scattered throughout this book, bits of evidence of the respect
that we had achieved are presented. Before a President was scheduled to
make a particular speech on a broad array of subjects, OST was asked for
input by the President's immediate staff. Such was the case when the OST
international technical assistant, Dr. Norman Neureiter, asked the staff
to submit a list of inter-national initiatives for consideration (240)

International

1. The President should mention the general importance of science
communications in his Administration and state that he has asked his
Sciene Adviser to head up a team to attend the memorable UNESCO UNISIST
meeting in Paris to be held in October 1971.

2. The President should announce his intention of calling for an
international clearinghouse on earth resource information gathered by
satellites. He should invite all nations tol participate in this program.

3. Similarly, he should make clear that it is his intention to establish a
substantial environmental quality information system in the United States.
Other countries, he hopes, will join the United States in a cooperative
program.

4. He can amplify his comments with an assertion that his administration
is committed to improved STI interchange with other countries, even those
that have not been particularly friendly. To this end, he is asking all of
the STI-generating agencies of the Federal government to strengthen their
STI-interchange programs with other countries.

5. Call on the youth of the United States and other countries to throw
their energies into the task of modernizing and improving the
international STI exchange mechanism as a useful global goal that would

help unite peoples. He will ask his Science Adviser to form a national committee to achieve this goal. He will ask that other countries do the same (240).

(240) Aines, Andrew A., OST, Memorandum to Dr. Norman Neureiter, OST, Subject: A Few International Initiatives, April 30, 1971, 1 page.

OST Drops Out of STI Stewardship:

(This section should be combined with other observations about the decision of Dr. David to withdraw OST from STI leadership.)

Out of the clear blue sky came a bolt of lightning in the form of a letter from Dr. Edward E. David to Dr. William D. McElroy, Director of NSF (241). It was written by David Z. Beckler and a copy was eventually sent to me, but one reason why it tarried is seen in a cover notation:

This document has been removed from the OST Central Files. Please return it to file as soon as possible. If this document is to be referred to any other staff member, please notify Mrs. Graff, Extension 3544 . (Underlining added)

I assumed that this unusual control was placed on the file primarily to keep me in the dark about what was going on. Why secrecy was decreed, I do not understand to this day. Certainly, Dr. David had the authority to do what he pleased, regardless of how COSATI members or I felt about the change. My concern dealt with the lack of "due process" - a code that should not be a stranger in the Executive Office of the President - and in not being given an opportunity to respond to the criticisms of COSATI.

(241) David, Edward E;, Director, OST, Letter to Dr. William D. McElroy, Director, National Science Foundation, April 23, 1971, pop 2.

(242) McElroy, William D., Director, NSF, Letter to Dr. Edward E. David, Director, OST, March 26, 1971, pp 2. Also an enclosure prepared by OSIS/NSF, Subject:Program and Justifivcation for Revised Organization and Operation of COSATI, March 17, 1971, pp 5.

The letter referred to a previous letter from MeElroy to David, dated March 26, 1971, which obviously was also withheld from me until a few weeks later (242). The McElroy letter is summarized as follows:

The Foundation is pleased to accept the Chairmanship of COSATI. We concur with the guidelines you have outlined. The suggested close association of COSATI with the Foundation's research program to encourage the involvement of information userc is intriguing. We understand that no additional positions and resources will be furnished, pending a decision in September 1971 on the future organization of COSATI and the make-up of the program. We will take steps to get a personal allocation from OMB to support COSATI at its present level.

A brief outline of the NSF document, Program and Justification for Revised Organization and Operation of COSATI, dated March 17, 1971, follows:

To become a more effective coordinative mechanism, COSATI needs redirection of its activities, an organizational structure keyed to specific goals, a defined program permitting review and evaluation, and active participation of concerned elements of the public and private STI sectors. Redirection is required because COSATI has become too large, too many problems addressed fragment COSATI's efforts, and increasingly COSATI has solely become a channel for exchange of information. It should now turn only to critical problems and become more advisory and more catalytic to FCST, OST, OMB and the member agencies. There is a need for better coordination between the public and private sectors to avoid duplication and overlap. This argues for the coherent development of a nation-wide network. COSATI can be organized to accomplish this. COSATI meetings should be organized to reach decisions, formulate policy and action recommendations.

I found that these criticisms were mostly half-truths and platitudinous. FCST had not given COSATI any authority beyond making recommendations. Congressional groups had noted this weakness and advocated that COSATI be given more authority to direct action within the government. OST authorities were aware of these criticisms and weaknesses, as revealed in my frequent reports to the Director of OST and to OMB officials, but they did virtually nothing to help. The reader will find numerous instances of these pleas in this book. For example, COSATI worked hard to establish a blueprint for a national information system for science and technology, a project well-documented in this book. OST was asked to carry this program forward by FCST. The resources required were only four persons. A request for additional spaces from Dr. Hornig was turned down by OMB and Congress. The statement that COSATI was not interacting closely with users is another example of an accusation that would not be upheld by objective obnservers. Much of the information being shared at COSATI meetings came from government officials involved with specific information needs and programs, from representatives of the professional societies and trade organizations, from information policymakers in Congress and the Executive Branch, from representatives of international organizations and foreign countries, from study groups in and out of the government, and from generators and users of STI. COSATI was in close contact with all of these groups. How else could it coordinate, recommend policies, amd maintain constant pressure for better STI programs and techniques?

An assertion is made on page 2 of the justification document that the redirection of COSATI efforts...can benefit by NSF leadership. Title IX, National Defense Education Act of 1958, is cited for authority possessed by NSF to provide national STI services. This authority was reduced to some extent by Reorganization Plan No. 2 in 1962. It is apparent in the plans, programs and performance of NSF in the 1970s and 1980s in matters dealing with Federal STI that NSF did not live up to this agreement. NSF leadership of the total
STI community within a few years became negligible. When OST and OST were abolished two years after the agreement was made, a move that eliminated COSATI completely, NSF began to lose interest and ultimately shifted its efforts to information science grants. Although NSF's funds began to soar, its funding of science information declined dramatically. The Science Information Council, mandated in Title IX, NDEA, itself disappeared from

NSF by dint of some slight of hand performed under cover of a sunset law crusade. The agreement between Drs.David and McElroy was con veniently forgotten by the NSF leadership.

The COSATI organization, according to the justification document, would be reduced to five principal task groups: networks, science information research, international activities, government-wide project reporting, and Federal funds and statistics. Support of the panels would come from a NSF supporting staff. New issues and programs would be delegated to the five task groups. A small support staff working for the COSATI chairman would provide liaison and secretariat services, prepare staff studies, and arrange for and manage supporting contract studies.

The David response to the letter and the plan started with an expression of pleasure that NSF was prepared to accept the chairmanship of COSATI. Dr. David agreed that the approach of NSF to have COSATI re-direct its program to meet specific goals and objectives was in accordance with his own views. David then emphasized the need to have closer interaction between COSATI and the real users of STI. He called on NSF to defer changing the organization of COSATI until a review was made of the status of its work and future needs by a group studying COSATI. He stated, however, that all COSATI panels and task groups should be asked to prepare final reports of their activities by September 15, 1971. These reports would be included in an overall report by COSATI to be presented to the Federal Council in the fall. At that time, COSATI would be asked to recommend to FCST what policy issues required its attention in 1972. David then stated that he anticipated the number of COSATI subgroups would be sharply curtailed and those that were continued would be ad hoc with specified lifetimes. Then David stated in view of the foregoing additional staff positions and resources for the support of COSATI did not appear to be justified. David concluded:

With your concurrence, I would plan to announce at the next meeting of the Federal Council that the NSF will assume the leadership of COSATI, and that the work of COSATI will proceed along the aforementioned lines for the next several months.

I must admit that I was stunned by these "going-ons." either Dr. David or Dave Beckler had hinted or informed me earlier that they had any problems with COSATI, its organization and its performance up to this point. While it is agreed that keeping secrets in the government is difficult, I had no advance knowledge from NSF or other agencies involved with COSATI that something was in the wind. Later, after I was transferred to NSF as a senior staff associate, I was told that the NSF Science Information Council had recommended to the NSF Director that he put in a bid for COSATI. Later, I did recall that Robert Howard of OMB had suggested some COSATI actions similar to the requested changes that appeared in the David letter, but according to Hu Loweth, Howard's superior, OMB was not responsible for the shift in leadership. Oddly, I had agreed with some of the proposals of Howard to reduce the size of COSATI and the number of its panels and task groups, a process that had already started. But, I recognized that Dr. David's directive was valid, even though I did not agree with it, and that the only course of action left to me was to help

NSF do the best job that it could. Once again, I must admit to being personally disappointed but not surprised that I was not informed about what what going on by my bosses, nor was I given an opportunity to comment on the proposed change.

I am not certain that this went into the decision made by Dr. David, but It was clear, at least, to me that the change was a signal that OST did not feel compelled any longer to please the congressional committees that were still calling for a strong Executive Branch STI program. It was also evident that Dr. David did not share the same commitment to science communications of the previous Science Advisors to the President: Vannevar Bush, Jerry Wiesner, Donald Hornig, and Lee DuBridge.

It also struck me that Dr. David must have been unaware in making his decision why a previous NSF director, Dr. Alan Waterman, had concluded in the early 1960s that the leadership of the interagency STI program would be better handled at the Executive Office of the President level. Dr. Hornig agreed with this assessment and assumed the responsibility. NSF was then able to put all of its energies into its information science research program and in completing its task of working closely with the professional societies in developing their science ommunication modernization programs, a very successful venture that never received the praise that it deserved. Dr. Burton Adkinson, who led the NSF information program in those years, confided that he was unable to get the kind of cooperative response from the other R&D agencies that NSF needed to be successful in the coordinating task. At that time, I was responsible for establishing and operating the Department of Army STI program, and was completely sympathetic with Adkinson's appraisal.

The shift to NSF saddened me for another reason. I was fully aware of the fact that the leaders who earlier had helped create a number of the agency STI programs were, in the early 1970s, retired, retiring or departing for other posts. These were very competent, highly motivated men and women. I reasoned that Dr. David's decision would be seen in the Federal R&D agencies as a sign of reduced OST interest in STI, protestations to the contrary. From that point on, there would be less stress on strong agency STI leadership and the need of close attention of the agency R&D managers on STI programs and issues with the passage of time. Moreover, I reasoned in 1971 that the R&D managers who were supportive of strong agency STI programs during the 1960s would also be retiring, leaving behind newcomers who would never be as aware and supportive of the importance of vigorous Federal agency STI programs as their predecessors. This indeed was what happened. But Dr. David at that time was under severe strain, knowing that the President was becoming more and more alienated from scientists, who "refused to act like White House team players." It stands to reason that STI matters could not have been high among the priorities of a science advisor who began to find himself presiding over the Federal science and technology estate at a bad time historically. It must have been a heavy burden for him to realize that he and the entire White House science mechamism might be facing the President's sharp axe, which did descend two years later, eliminating OST, FCST, and, of course, COSATI. If I were asked when the crusade to raise the level of Federal STI came to an end, I would offer the shift of COSATI out of the White House science apparatus as the first blow. The second and most telling blow came when President

Nixon dismissed his Science Advisor, Dr. David, and turned his back on
science and scientists. Almost as an afterthought, a golden apple gesture,
he designated the Director of NSF to be his Science Advisor, an action
which had to be a shaky way to still the catcalls arising from many
critics in the media, the world of science and technology, including
members and committees of Congress. From a political vantage point, the
Watergate fiasco is generally adjudged his worst blunder, but I am
inclined to the view that his ill-tempered dismissal of science was as bad
or worse a blunder. It is an irony to me that what his Science Advisor did
in transferring the control of COSATI to NSF, two years earlier, was just
as much a blunder, one that put Federal STI on the skids throughout the
government. It has never recovered.

It should be pointed out that Dr. David did not discontiune the OST STI
program completely. He brought A. Michael Noll into OST from the Bell
Laboratories. Noll had been involved in computer and similar research at
the Bell Laboratories. I assume that he was under the impression that he
would be involved in this kind of work when he reported to OST. Dr. Noll,
by his own admission upon his arrival, was unfamiliar with government
operations, in general, and with Federal STI or any kind of STI, in
particular. In Dr. Noll`s defense, he was operating out of his area of
expertise and tried hard to come to grips with the Federal STI program
and be helpful during his brief assignment that ended with the dismissal
of OST. Without COSATI as a base of operations, Dr. Noll had little to do
or to offer. It was my impression that the passage of time, Federal STI
managers came to the conclusion that OST was no longer a vital force in
Federal STI; consequently Noll's status was undercut by OST's seeming exit
from Federal STI and the transfer of COSATI leadership to NSF.

(243) Rossmassler, Stephen A., OST, Memorandum to Andrew A. Aines, OST,
Subject: SEQUIP Report, May 12, 1971, pp 3.

Environmental Quality

After a considerable effort by the Kissman Task Group, the long-awaited
SEQUIP report was delivered to OST in draft form. It was reviewed by Steve
Rossmassler who found it "the product of much effort, much intelligence,
and much dedication." Dr. Rossmassler also recommended no further action
beyond circulating the report to the Federal agencies as a valuable source
book. He found that the report lacked a rational blueprint for EOP or
agency action; it was structurally confusing, failing to distinguish
between an ideal and an implementable program. He pointed out that the
summary alone took up 38 pages, offered 38 recommendation, and was loaded
with ~descriptive material that should be relegated to the body of the
report." More disturbing to Dr. Rossmassler was the sweep of the
recommendations that went far beyond environmental quality and sought to
restructure "the whole tangle of Federal STI policies, processes and
operations." The report did not recognize the limits of authority and
power of COSATI and OST, according to Rossmassler. About a year later, in
the fall of 1972, Dr. Noll began to show interest in the SEQUIP Report,
but the advice of Rossmassler prevailed. The Report was circulated to a
few of the agencies that were involved with environmental quality and that
was the end of it (243).

(244) Bernstein, George B., Naval Supply Systems Command, Chairman, Working Group on Micromedia, et al, Subject: Report of the Working Group on Micromedia, May 5, 1971, pp 18 + attachments.

Micromedia

In November 1969, COSATI formed a task force to study micromedia technology and make recommendations for actions that would aid in developing the potential of micromedia for the storage and dissemination of information. In early May 1971, the report was delivered. The task group was made up of the following persons from government and industry::

George B. Bernstein, Chairman
Special Assistant to the Director of the
 R&D Division
Naval Supply Systems Command

Thomas C. Bagg
Designer, Graphic Systems
National Bureau of Standards

Donald C. Holmes
Consultant

Francis L Kueht
Engineering Data Analyst
Defense Supply Agency Headquarters

John L. Simonds
Assistant Head, Physics Division
Eastman-Kodak Research Laboratories

Peter F. Urbach
Deputy Director
National Technical Information Service

Dr. David R. Wolf
Vice-President
Yerkes-Wolf Associates

The working group was asked to study: the use of micromedia within and outside of the Federal government; new micromedia developments and their limitations; combinations of micromedia and other advanced information technologies that may be attractive for use in the STI field; and recommend indicated actions including the development of new standards for COSATI and the Federal agencies.

Among the findings and recommendations made by the Bernstein Working Group are the following:

1. Standardization programs still beset the micromedia community. At least five groups have been setting standards, including COSATI. Logically, the responsibility should be put squarely on the shoulders of the American

National Standards Institute, which needs to be strengthened. Financial help should be provided to ANSI by the Federal government.

2. Executive branch support should be given a new Congressional bill (S. 1798) offered by the Department of Commerce to strengthen the government's role in the development of standards, working with ANSI

3. The previously accepted 20:1 microfiche ratio accepted by COSATI in 1965 should be changed to a 24:1 reduction ratio to afford higher packing density and conform with common practices resulting from technological advances.

COSATI agreed with the change in microfiche ratio, but not necesarily with support of ANSI as the sole standards-setting authority. The weakness of ANSI was discussed. Charles Meadow expressed his disappointment with the Bernstein report, largely because it did not provide all of the answers requested in the original COSATI charter. I thought he was correct, but after waiting for the results for more than a year, I did not believe we should do more than accept the report, flawed that it might be. Obviously, there were no technological breakthroughs to report, although improvement of the present technoilkogby could be expected. It made sense to me that ANSI should establish future standards, not COSATI. COSATI got into the business of standards in the mid-1960s because there was no alternative at that time. Now that ANSI was the national focal point for standards, and now that it represented the United States internationally, it was logical to throw governmental and industrial support behind it until it could support itself.

(245) Beckler, David, OST, Memorandum to Andrew A. Aines, Subject: Government-Wide Reporting, etc., May 24, 1971, 1 page. (Accompanied by an undated draft GAO document, addressed to Dr. David, pp 3.)

(246) Aines, Andrew A., OST, Memorandum to David Z. Beckler, OST, Subject: Research Project Data Bank, May 25, 1971, pp 3.

In May 1971, representatives of the General Accounting Office presented a document to the Director of OST, requesting a number of answers to questions on the status of Federal agency ongoing research reporting programs (245). Subsequently, David Beckler wrote to Aines; does the GAO letter to Dr. David have merit? How can we wrap-up our position on government-wide reporting on on-going activities? (246) The thrust of the GAO letter was as follows:

We are conducting a survey of STI exchange activities of Government agencies and of particular interest are the many information systems containing data on active Federal agency programs at an annual cost of $5 billion annually. These systems, commonly called data banks, can provide an active management tool to coordinate basic and applied researcn activities and prevent duplication of research efforts. We understand that no specific legislation exists that provides for the establishment of a Government-wide coordinated information system which would facilitate effective exchange of data on active research programs, although management studies and congressional reports, some as early as 1945, indicate the need. This was recommended in a 1962 report titled "Science

and Technological Communication in the Government," and again in the 1963 PSAC (Weinberg) Report on "Science, Government and Information." More recently, in 1967, the FCST Ad Hoc Task Group on "The Government-Wide Reporting of Science and Technology Reporting of Science and Technology Projects. The (Sherwin) report concluded that a Government-wide, machine-language information system which would give brief, up-to-date, technical description of projects after they have been started, should be established to aid Federal management of the then estimated 100,000 projects that totaled about $5 billion annually. Finally, a study of Government-wide R&D-reporting, conducted for OST by Peat, Marwich and Livingston, reported in 1969 that the need for a Government-wide reporting system was still valid and made recommendations to achieve a coordinated system for the exchange of R&D information.

Preliminary information obtained during our survey indicates that the responsibility for the coordination of Federal science information activities was assigned to OST under Reorganization Plan Number 2 of 1962. Although COSATI appears to be the mechanism established for achieving a coordinated information system and has sponsored several studies on the subject, we understand that OST has been providing the leadership in coordination of STI systems. However, we found no evidence that a formal plan for coordinating STI among the major systems has yet been developed. We would appreciate your views on the subject and the steps taken by OST toward achieving a Government-wide exchange of information on research activities (245).

My response, which is here summarized, to Dave Beckler was as follows:

The GAO letter is essentially correct about the studies, the needs, and the involvement of OST and COSATI. One problem we faced at the outset and all along was the lack of real OST and FCST support. After the PML study, which cost us $170,000, was completed, it was released to the agencies for comment. Based on their response, we prepared a new set of recommendations to further implement the program. This action was apparently not known by GAO . We briefed you and Hu Loweth of OMB at this stage, but OMB blew hot then cold on the implementation.

I stated first that this memorandum would focus on R&D project information, rather than on technology transfer.I then went on to provide Beckler with my views on the subject, which he could draw on as he pleased for a response to OMB. The call for a better system of handling ongoing R&D project information was made as early as 1921 by the National Research Council, long before computers and databases were contemplated. Getting to the present, I pointed out that one problem was that SIE was still located outside of the Executive Branch, presenting us with a problem of control. Its performance, on the whole, was less effective than we hoped for, nased on my discussions with users in the Federal agencies. Its list of Federal agency R&D projects continued to be incomplete and the Federsl agencies, for the most part, were not using SIE for this and other reasons. While we could press forward to recommend the establishment of a Center for Federal Government Current R&D Information, it was my belief that to make it work, Federal agencies would have to be simqlôáníouvÜù conditioned to use it properly. At this time, it was more appropriate to establish a common method of gathering, storing and transmitting data by all of the

agencies using R&D funds. The operation would thus be decentralized, but would establish a very small group to create the policy and monitor the program. This group could be formed easily by OST or FCST, which would provide continued oversight. Most agencies report that they are using the common data elements recommended by the Sherwin group with some modifications, but with the exception of DOD and USDA, have not favored open, computer-based systems. Information "gatekeeers" within the agencies, together with a nostalgia for personally-controlled information systems, have prevailed, because of the absence of strong signals from OMB and OST. It is my belief that the agencies will and are ready to take a positive approach, if the EOP said,"Do it!" It is also my belief that Congress is irritated by the failure of the Exeutive Branch to move forward. Some critics in Congress have seemingly concluded that it is a deliberate Executive Branch policy to prevent the establishment of an efficient government-wide R&D project-reporting system rather than to get on with it.

You will recall that we asked OMB to combine SIE (Smithsonian Institution) and the National Technical Information System (NBS). Not only would this result in what we have been referring to as "one stop" service, it was a way to give what remained of the SIE new directions until the decentralized system advocated above had a chance to jell. With such a system in place, we could require agencies to automatically send R&D project data of mutual interest to one another. With a sound system in place, we could ask applicants for R&D funds to certify that they have checked the R&D project database prior to getting funds or authority to proceed. You will also remember that OMB agreed to look at what needed to be done to combine the two functions at NTIS. You will remember that a couple of years earlier, OMB was responsible for turning SIE over to the Smithsonian Institution for management purposes, taking it away from NSF, which again you will remember was anxious to get rid of it, because SSIE and the Smithsonian persisted in running to Congress for relief from NSF's oversight, but not NSF's funds. The Ash Committee, which was then reviewing government organization, independently studied the problem and decided to place both NTIS and SSIE into a proposed Department of Economic Affairs, perhaps with OMB advice. Nothing came of this effort, however.

A decentralized system can still be set up, regardless of other possibilities. This, then, is what I would say to GAO during the upcoming meeting. A final thought. OST should take a strong and positive stand, regardless of the position that OMB takes, because the program we are suggesting does not impose on the Federal agencies and does little to erode their authority. It would signal that OST is interested in improved R&D management, a legitimate position to take. It would support the more progressive R&D managers in the Federal government who are ready to move forward. OMB itself is now involved in improving its own information mamagement program, as is Congress, thus the timing is better than it was a couple of years ago.

Dr. David and Mr. Beckler met with the GAO representatives on June 2, 1971. Dr. David, who had paid little or no attention to agency information systems to my knowledge, stated that he was disenchanted with non-effective and non-examined information systems among the agencies. One reading was that his views went beyond project-reporting into

bibliographic systems. There was no sign that he would discuss the matter and my recommendations, above, with OMB. David Beckler thought that the next course of action ought to be a paper to be discussed at the next FCST meeting. I agreed to prepare some appropriate thoughts on the subject, which are summarized as follows:

(247) Aines, Andrew A., OST, Memorandum to Dr. David E. David, Director, OST, Subject: Commentary on Agency Information Programs, June 7, 1987, pp 6.

Your comments at the GAO meeting were discussed with Dave Beckler, who urged me to send you some thoughts about project-reporting and the general health of the Federal STI program that could be presented at the next FCST meeting. I have divided my paper into four parts: a short statement of the problem; a few selected thoughts bearing on the problem; what can and should be done about the problem; and a concluding observation.

1. A Statement of the Problem

These are the kind of questions that need to be asked to get to the heart of the overall problem: How effectively are the Federal agencies managing their STI programs? Is EOP doing a proper job to get this answer? Who has the responsibility of coordinating information system plans, programs and budgets on an agency-wide basis? What group is charged with national information system development and interaction with the private sector? Who calls the shots on and seeks a harmonious approach for dealing with international STI development? Who worries about the creation and interworking of national networks and databases in terms of function, use, and effectiveness? Who is responsible for encouraging agencies to use new information technology wisely and keeps his eyes on results, some negative, of their use? I would argue that the problem from the OST standpoint is to recognize that it is the only group in the Federal government that looks at the total information use and application problem. In assessing the health of COSATI and the Federal agency STI problem, these larger issues must be considered to achieve success. This not being done at Federal agency level. The problem is that only OST does this kind of appraisal, development and management, but with insufficient resources and support. Even when we see what needs to be done, we are ill-equipped to take necessary action. I think that history will sustain this criticism.

2. Selected Items Bearing on the Problem

For over a decade Congressional committees and individuals have criticized the way EOP has handled the STI issue. Our file is full of comments from Humphrey,Daddario, Elliott, Pucinski, and others. Currently, the pressure is coming from Dingell, Brooks, Davis and Pucinski to create better, more open STI systems; environmental data is an example. Surveys by GAO, Congressional Research Service, usually resulting in criticisms, are not apt to decrease. The strong effort to computerize Congress's information processes will bring greater sophistication and more efforts to require improved data programs and linkage from the Executive Branch. The formation of computer and data-processing programs in OMB will be of little value to us, as long as it hews to the Brooks Act line. OMB's

budget examiners group has been both a help and a hindrance, depending on the calibre of the individual examiners who work with us. The same can be said about the Office of Telecommunication Policy, which is more worried about survival. Only OST has a substantial record in seeking to make progress in field, and this with a minimal staff and other resources. In your writings and talks, there is expressed concern about our knowledge base, the need for instant and accurate information, the requirement to avoid stagnation and dullness, timidity in new undertakings. I agree with what you have said and so do others in the Federal government. Other science advisers have worked hard for the STI program. Dr. Donald Hornig went to Congress to ask for a few additional spaces for his STI and his energy program. He pleaded with OMB to do the same. He got extra spaces for energy, but not for STI. We carried on, trying to get a few more part-time agency people to help us with programs that were either approved by FCST or not vetoed by OST. Only one person in OMB was critical about our using more agency workers to support COSATI. With all of the burden, we sought to keep our reasonably successful agency STI stewardship program alive in OST so that we would know what was really going on within the agencies. In no agency did we find an internal stewardship review program made by knowledgeable agency R&D authorities that would make OST reviews unnecessary. My reward for diligence has been criticism, on occasion, from those agencies whose STI programs reflected poor management and scanty oversight. But the Corning Report in NIH, the Raymond Report in DOD and others, one-time reports commissioned by the agencies, substantiated OST fisdinga. Agencies refuse to integrate library, information centers and . information analysis centers activities. Planning, coordination, policy formulation, management, supervision, training – the raw materials of management – are often absent. My weekly reports to the Directors of OST, which have been flowing since 1964, amply recorded these and other problems we encountered within the agencies. Countless requests for guidance and help to offset the lack of power of COSATI chairmen to achieve progress received little attention.
On the rarest of occasions, we received token help from an OMB examiner. Frequent pleas were made to OMB officials for help with one or more agencies where there were difficulties, as the record will show, but this was not forthcoming. The FCST mechanism operated with limited power. After agencies make agreements to do something or refrain from doing something, there really is nothing we can do if they are recalcitrant or if help is not forthcoming from OST and FCST leadership. In light of the above and because of the your unexplained and vague expression of dissatisfaction with the government STI programs to David Beckler, revealed to your technical assistant for STI for the first time, I must complain about your decision to move COSATI leadership out of OST. This too, I remind you, was also made without discussion with me, a decision which will inevitably result in further deterioration of all Federal STI programs, I predict.

3. What Can or Should Be Done About the Problem.

Here are some informal suggestions:

It is time that the Director of OMB appraised his own organization to determine how well it is coping with information trends and activities internally, with those of the Federal agencies, with Congress, and with other groups. There is much room for improvement.

A similar reconnaissance should be made by the Director of OST, bearing in mind that the next Director of OST may not be as well equipped as you are with wide knowledge in communications. In an organizational and long range sense, OST should not shirk this task,

I see the need for a careful study of Federal agency plans dealing with information, data processing and communications. There is a growing need for upgraded knowledge about how they obtain, handle, store, retrieve, and disseminate information. This study should include a review of how each agency manages, coordinates, assimilates and utilizes new knowledge. A study of the formal plans of each agency, if they have one, should be included in the above. An assessment of the health of each agency program is also needed.

In its own interest, the United States should undertake a study of what it believes the international information scene may resemble in the 1980s. During this exercise several alternative models of what the United States would like to see in the near and mid-range future. More than STI should be included in such a study. There might be merit, if the study was undertaken with the help of NSF, Commerce, and other agencies.

I would recommend yet another study, this one on the need and value of a Department of Information or Communications in the Federal government. This should be related to the growth of municipal and state government information systems. I am not convinced that the establishment of a Federal Information Department is feasible or desirable, but I think that such a study will reveal gaps and overlaps that might deserve attention.

One special problem involves what could be referred to as the uncoordinated information programs or lack of programs in conglomerate Federal agencies, such as the Departments of Interior, Commerce, Defense and HEW. It is my view that unless there is a coordinator of all STI programs at the level of the agency Secretary, there will enevitably be a failure to improve the programs or if there is coordination and it is withdrawn, STI programs will make no progress or they will degrade.

Finally, consideration ought to be given to the formation of a Council on Communications at the Executive Office of the President level. Its function would be to bring together all information and communication organizations in the public and private sector. Its purpose would primarily be to exchange information and direct recommendations to the President (247)
.
As expected, there was no reaction from the OST front office. But, again, it was increasingly clear to me that the Director, OST, Dr. Edward David, was breaking ranks with his predecessors, and was edging away from personal and office interest in science communications. When I was lining up the chairman and members of the team to represent the United States at the ICSU-UNESCO UNISIST conference to meet in Paris, I recommended to Dr. David that he head the group in keeping with the calibre of the team being sent by the Soviets and other countries. Dr. Harrison Brown, NAS Foreign Secretary, who was taking a leading part in the establishment of UNISIST, also recommended that Dr. David head the U.S. delegation, largely because

of the reputation that OST had achieved in world science communications. On the document that extended an invitation to Dr. David, he scrawled the words, "Why not NSF?" This was in March 1971, during the period in which he was obviously negotiating the takeover of COSATI by NSF (248).

(248) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: Weekly Communique, March 13, 1971, pp 6.

A Professional Society Gambit

For the second time in 18 months, the American Institute for Chemical Engineering (AIChHE) made it known in a very unusual way that the society and its publishing program was in dire straits. This became apparent when I received what appeared to be the front page of a newspaper, named The Times, dated September 20, 1971. One article had the heading: "Engineers Quit AIChE, Society Closes Doors. Another read, "Colleges Shocked at Society Closing." A third headline read: "CEP (Chemical Engineering Progress), Journal (AIChE) Publish Last Issues. Tucked away in the package that was sent to me by the American Institute of Chemical Engineers was a card which read:

Dear Chemical Engineer:

The enclosed newspaper page depicts what would happen if some of the 36,000 chemical engineers who belong to AIChE decided not to support their professional society. Perhaps this picture of the role of AIChE in chemical engineering will make you reconsider your part in preserving and advancing the profession.

I wrote a note to the Director, OST:

Much to my amazement, the attached "simulated" newspaper came across my desk. It is the second time, it having happened about 18 months before. I spoke to the perpetrators then, who explained that they were using a shock treatment on their associates so that they would understand the cost of non-support of AIChE and its publishing program. I guess it worked then when membership was declining, but a second jolt was now necessary.

This was all there was to it. I was shocked at that time that reputable scientists and engineers would concoct a phony newspaper to drive home their message, important though it was to their survival. Their reaction was that the end justified the means (249).

(249) Aines, Andrew A., OST, Memorandum to Dr. Edward E. David, Director, OST, Subject: AIChE, May 28, 1971, l page (with attachment).
(250) Andrew A. Aines and Meadow, Charles T., OST, Memorandum to Dr. Edward David and David Beckler, OST, , Subject: List of Uncompleted Projects, June 10, 1971, pp 4.

In response to a request that I prepare a list of unfinished OST projects, I submitted the following. Because several of these projects are still undone more than a decade and a half later, they are listed for the edification of the interested reader.

Improvement of the Federal current R&D project information system that would feature a standard format and an automatic data-sharing system whose operation would be largely decentralized.

The development of a Federal and national information system for science and technology that operates through a system of "responsible and delegated agents."

Formation of a special interagency task group to study certain issues related to rights of respondents and test subjects engaged in social studies.

The Vlannes Panel is preparing a one-shot survey of Federal agency obligations and expenditures for Federal STI. This should be a continuing effort to determine what the real costs annually of Federal STI, now in the billions of dollars.

The Bernstein micromedia workgroup is preparing recommendations for standards and actions in the micromedia field. Agency-wide programs designed to track new information technology should be supported.

The SEQUIP (Kissman) Report contains many useful observations and recommendations. OST should follow up on this document to make sure it gets requisite attention.

The Downie Report on information dissemination has been completed and no action has been taken by FCST at this time. Though it is an "uneven" document, it contains a few pertinent recommendations. Like the Bernstein, the SEQUIP, and the Vlannes studies, steps should be taken by OST to implement what is clearly implementable.
OST should continue to work with OECD in the development of its information, communications and data processing program. Several of the OECD projects had their genesis in OST and the Federal agencies. The same can be said about several of the initiatives of the UNISIST program by UNESCO and ICSU.
No date and no agenda have been set for information-communication meetings with the Canadian and Mexican governments, but, even if the incentive is currently low, consideration should be given to trying to open the dialogue once again. Mexico, if not Canada, would welcome such a meeting. More needs to be much more done in the technology transfer area, an area of long interest to OST and FCST. Discussions have been held with representatives of GAO and the Senate. A COSATI document has been prepared on the subject.
    The Bell Report on Earth Resource Satellite Data has been completed and awaits further action. This report focuses on the efficient and effective use of telemetered data, and less on the machinery used for its acquisition. Consideration about next steps that could be taken is needed.
    The Brady Task Group on page charges will be completing its work before long. Here too, action will be needed to implement its recommendations.
The Smithsonian Institution is currently appraising value of the Barchas collection of rare scientific books. OST will be able to help by convincing OMB and Congress to support the effort.

OST has been represented in the Federal Library Committee program. It should continue to monitor this effort and continue to work ckosely with the Library of Congress on other initiatives such as the RECON project on cataloging. OST has been diligent in its effort to work with various individuals and groups in the Congress. OST should take steps to protect what it has succeeded in doing with Congress.

OST has succeeded in fashioning a considerable bridgehead to the private information sector - professional societies, private publishers, data base brokers, and others. OST should be unwilling to let the friendly and hard-won interaction disappear.

OST has earned the respect of some groups in OMB in reviewing pending congressional legislative initiatives dealing with information matters. The last area studied at the request of OMB involved environmental quality information.

Agreement is nigh total that NTIS should be awarded responsibility for the gathering and dissemination of unclassified technical reports and information about current R&D projects. This would provide one-stop service where both databases would be available. This needs to be followed up.

The COSATI (Miller task group) Privacy Guidelines project was transferred to OST and then OMB. Consideration is being given to the formation of an interagency group to study the matter further.

There are a number of programs devoted to the education and training of executives and information that COSATI and OST have been identified with. OST should show its support for further actions in this important field.

OST should continue to monitor the affairs of the U.S. National Commission on Libraries and Information Science and similar groups.

How can we bring the public and private STI sectors into a closer working arrangements through which all of us will gain? This is matter is receiving the attention of the Murray Task Group. OST should encourage this program.

Jack Stearns and Robert Bell of NASA are studying the possiblity of expanding the Federal use of the NASA RECON system, OST and NSF should follow up to determine what action can be taken.

OST is involved with a program to protect U.S. software programs abroad. John Farmakides, who heads the COSATI Panel on Legal Aspects of Information Systems and Barbara Ringer of the U.S. Copyright Office attended the World Intellectual Property in Geneva. The U.S. Department of State has shown some interest and is interacting with us.

OST has encouraged A.I.D. to finance a program to bring Latin-Americans to a series of workshops on STI and library programs. Two of nine sessions have already been completed with favorable results.

Discussions have been held with Dr, Maximo Halty of the Organization of American States to explore the possiblity of establishing a Western Hemisphere National STI Focal Points Working Group. TYhe Soviets, it is reported, were planning a similar course of action in Latin America.

The above was a partial list of projects that OST had encouraged. In my view, OST's involvement in monitoring these and similar programs would be the litmus test to determine its real interest in the Federal STI program. Some of them are still do-able many years later (250).

As I made ready to turn the reins of COSATI over to NSF, Charles Meadow turned over the COSATI Executive Secretary's post to Lawrence Atwell in OSIS. Marion Fitzhugh, my secretary, as competent and as loyal a secretary as I ever had, was invited to join us in NSF, but she decided to remain in OST.

Privacy Guidelines

On April 1, 1971, Dr. David sent the augmented Task Group on Privacy draft report to the Director of OMB, George Shultz.

(251) David, Edward E., Director OST, Memorandum to George Schultz, Director OMB, Subject: Suggested Federal Guidlines for Protection of Individual Rights of Privacy, April 27, 1971, Cover letter was one page. The Miller Report draft was 17 pages in length.

The cover letter explained how the draft report came into being by Arthur Miller and his COSATI task force. Dr. David then wrote:

The panel recommends that a high-level, interagen cy task group be established to develp guidelines or stgandards for governmentwide application. In view of the central role of OMB in the computer and information management areas, I am transmitting the attached report for further study bvy OMB and consultation with the appropriate agencies. The OST will be pleased to continue to work with the OMB Statistical Policy and Management Information Systems Division to this end. The current Congressional and public interest in the privacy question and the number of federal agencies affected underscores the importance and timeliness of an Executive Office initiative.

(252) Shultz, Dir OMB, Memorandum for Dr. Edward E. David, Dir OST, Subject: COSATI Draft Paper on Suggested Federal Guidelines for Protection of Individual Rights of Privacy, May 25, 1971, l page.

Dr. Schultz acknowledged the receipt of the COSATI paper and wrote:

As you noted, the OMB Statistical Policy staff, which has recently drafted several proposals for improving the confidentiality practices of Federal statistical agencies, is studying the COSATI panel recommendations carefully. I understand they will be contacting your staff shortly to discuss the Panel's proposal to set up a high-level interagency task force to develop governmentwide guidelines and standards for protecting the rights of privacy of individuals about whom information is collected or filed by Federal agencies.

After departing fronm OST, I received no information about what happened to the COSATI document. I assumed that the agencies received reference copies of the document, as we suggested earlier. Professor Arthur Miller transferred his immense talents to the Harvard Law School during this period and became an illustrious resident expert on privacy and other legal matters dealing with First Amendment rights and Information Age policies. I cannot help but believe that his experience with the COSATI Panel on Legal Aspects of Information Systems in the 1960s and early 1970s

was a springboard to the fame that he justly earned in the last two decades (251 and 252).

Environmental Quality Information Program

Interest began to increase about the need for an organized environmental information center operating in the international sector. Our authorities decided to prepare an action proposal on information systems for international environmental decisions. John Butcher, OST Technical Assistant, asked me to review a draft paper on the subject (253).

(253) King, Donald R., Department of State (State/SCT/En), Subject: Action Proposal on Information Systems for International Environmental Decisions, April 19, 1971, pp 20.

Early on, the need of an international EQ information center was discussed from time to time with Don King, when he was a fellow member of the OST staff. The subject was also discussed with Dr. John Buckley, EQ senior technical assistant at OST. Dr. John Butcher, a most competent and amiable colleague, like his predecessors, took command of this area with the passage of time. In my response to his query, I wrote (254):

(254) Aines, Andrew A., OST, Memorandum: Draft Paper on U.N. Conference on the Environment, June 14, 1971, 1 page.

I am somewhat familiar with the document having interacted with King and Buckley in its preparation.

Suggest that the information center be kept as a "low profile" program. The U.N. should avoid getting into the physical exchange of EQ information and data. Bear in mind that OECD, NATO, and other groups are considering similar programs. The information center staff should therefore be kept very small to preclude the development of grandiose program. One positive aspect of the program is the hope that it will bring the East and West together in a cooperative effort, but history has shown that the East manages or tries to get control of the information mnechanisms. We ought to bare our teeth to prevent such an eventuality, since, as usual, the U.S. will be paying the lion's sharew of the costs. The paper as written does not wrestle with the existence of UNESCO's UNISIST STI program; we would not like to see a duplicative program undertaken in this area (254).

During this period, NSF organized an effort to establish an environmental quality information center at the Oak Ridge National Laboratories, Oak Ridge, Tennessee. Dr. Larry Goldmuntz, Executive Secretary, Federal Council for Science and Technololgy, gave me a copy of the NSF-RANN proposal and asked for my views. I wrote:

If what NSF and ORNL have in mind is a unique, dedicated EQ data system, separate from the vast, inadequately uncoordinated system that exists today, I predict that it will be a boondoggle and an impossibility. Without a definition of what constitutes EQ information and data, we have an open-ended system that can be costly and a mess. The costs cited for an exploratory EQ information system are excessive, the highest for any information system that I have seen. What happened to CEQ and EPA? Is it

not their bailiwick? What happened to the Dingel Bill to create an EQ information and data system. I agree with the view that currently it is probably beyond the capability of the private sector to create such an information system. I have informed Mel Day, who is taking over a COSATI chairman, about this proposal. During this period, it was not unusual for NSF authorities to overlook the need of doing requisite internal coordination, hence Day was unfamiliar with the proposal. As soon as he was informed, he agreed to inspect it. In a meeting with Glenn Schleede, the OMB EQ person, he agreed that the proposal was "vapory." He found it interesting that NSF's RANN officials had not discussed or coordinated the project with OSIS, OST and COSATI (255).

(255) Aines, Andrew A., OST, Memorandum to Dr. Lawrence Goldmuntz, Executive Secretary, FCST, Subject: Environmental Quality Data System, 18 June 1971, pp 3.

New Chairman for COSATI

After 5 years as COSATI chairman, the mantle was passed on to my old friend and colleague, Melvin S. Day. At the COSATI meeting of July 21, 1971, I passed the gavel with these words:

Mel, at this time, I pass the gavel to you. Because of your Federal government STI accomplishments which have been unequalled over the years, accomplishments that encompass considerably more than the work you have done in DOE, NASA and NSF, I am reassured that you will do everything you can to make COSATI successful. I am proud and delighted that you were chosen to carry the torch. You know that you will be able to depend on me to help you in your new mission.

Addressing the members of COSATI, I thanked the community for its long-time cooperation and warm friendship, and concluding with the following:

Occasionally being executive secretary and chairman of COSATI was fun, but most of the time it was a challenge and an adventure. Committees, we all understand, not being line or staff, can only succeed to the extent that their sponsors supported them and its members were ready to work to accomlish their missions. If the climate was favorable, our success might be measured in feet, but, if unfavorable, we would be lucky to measure success in inches. But as an FCST committee, we probably did better than most. We were most successful in the early and mid-1960s for at least two reasons: the need to upgrade Federal STI capabilities was most acute and warm support flowed from both the Congress and the White House to get the job done. The latter's support began to dwindle with the passage of time and the upwelling of other problems and priorities in science and technology. I will not bore you with a long list of what I consider to be the accomplishments of COSATI, rather, I will pledge my full support to COSATI, NSF, and to Melvin Day, who will need all the help we can give him, now that the COSATI leadership has moved out of the Office of Science and Technology to the National Science Foundation (256).

(256) Aines, Andrew A., OST, COSATI Chairman's Notes, July 21, 1971, 1 page.

(257) Atwell, Lawrence A., Secretary, COSATI, Minutes of the COSATI Meeting, dated July 21, 1971, pp 5.

At the request of Aines and Day, Dr. Edward E. David, Director OST, came to this historical meeting. Here are some of the comments that he made:

COSATI has been a vital force over the years and will continue to be so in the future. The transfer of COSATI to NSF is a progressive step for COSATI, for the science and technology community, and for the Federal agencies. COSATI is one of my special interests. I wish it great success and will continue to support COSATI and the scientific and technical information community.

He expressed the belief that the activities of NSF would be augmented considerably by this change; he hoped for a better focused activity; and asked for a review of COSATI's mission and goals.

Melvin Day thanked the OST Director and graciously made comments of appreciation to Aines, previous COSATI chairmen, and to the members and observers to COSATI. He announced that Colonel Aines would take over as Chairman of COSATI's International Panel and act as secretary of the delegation going to Europe for the UNISIST meeting. Other members of the UNISIST group would be Dr. William McElroy (chairman), Lewis Branscomb (NBS), Robert Harte (ASBC), Martin Cummings (NLM), Melvin Day (NSF), and Harrison Brown (NAS).

I must admit that I found Dr. David's well meant comments not entirely palatable. The STI managers of the Federal agencies were not enthusiastic about NSF's taking over the COSATI chairmanship, not because of any negative views of the prowess of Melvin Day, who was well admired by all, but because they recognized that the withdrawal of OST from the Federal STI leadership role would inevitably undermine COSATI and ultimately their own agency status (257). Their fears turned out to be well founded with the passage of time. Because of the way that STI matters and authority were organized in NSF, with an additional layer of management between the Head, OSIS, and the Director, NSF, Melvin Day began to encounter obstacles not perceived before the COSATI shift.

Congress

While the SEQUIP study did not receive an enthusiastic welcome in the Executive Branch, it did receive kudos from Congressman John D. Dingell, who recognized the need for a government-wide environmental information program. Mr. Dingell inserted a statement in Extension of Remarks, Congressional Record, some of which is extracted below.

On May 17, 1971, The House passed H.R. 56, the National Environmental Data Systems Act to bring some order and accessibility to the growing body of information on environmental quality and natural resources. During consideration of this bill, I became aware of a project in ther Executive Branch entitled "Study of Environmental Quality information Programs or SEQUIP. The findings of expert panel which performed the study have now been made available to me by Dr. Edward David, the science adviser to President Dixon. It is gratifying to my subcommittee that the SEQUIP

report comclusions are virtually identical to the provisions of the legislation passed by the House and now awaiting action in the Senate. Our original proposal was for a "data bamk" but as the SEQUIP group concluded, a massive single information storage unit would be unrealistic. Instead H.R.56 proposes a central national coordinating facility.

Dingell then proceded to insert the conclusions and recommendations of the SEQUIP Report in the Congressional Record (258).

(258) Dingell, John D. of Michigan, Extension of Remarks, Congressional Record, Subject: National Environmental Data System, August 6, 1971, pp E8971-E8973.

One reason why the SEQUIP Study was shelved, I suspect, resulted from its recommendation (R.11.10) that a new COSATI panel be established to implement the recommendations of the Kissman Panel. The COSATI structure was then being scrutinized to determine where re-organization and cutbacks were possible. Despite the need for such a panel, the climate for further COSATI growth was evaluated as poor.

Examination of COSATI

My transfer to OSIS-NSF completed, I was asked to think about the reorganization of COSATI, called for by Dr. David, and how to go about setting up an effective and economical approach to the task. This resulted in a staff study. Some the highlights of the staff study are as follows:

A Short History of COSATI

Early on, COSATI employed an Operating Committee with a number of ad hoc subcommittees. With the passage of time, it was felt that this approach had become non-productive. In the mid-1960s, a shift was made to a panel/task group approach to encourage longer term, continuing actions in education and training, standardization, information R&D, and the like. It became more evident that success in any program depended on the the quality of panel chairmen
and members; the urgency of the issue or problem to COSATI members and their organizations; the importance of solving the problem to the agency providing the chairman and members of the task group; the interest of FCST and such tangibles as: its willingness to give priority to an issue; the perceived extent of a problem, the overall health of science and technology, and the interest and support of Congress and the private sector.

It was noted increasingly that the boundaries of science and technology were becoming hazier and that non-R&D Federal agencies had a considerable stake in harnessing the information-processing revolution to their mission needs; this reality resulted in an increase of the number of observers to COSATI. Through new starts and projects, an effort was made to diversify the COSATI programs. Documentation improvement and control, which received the most
attention early on from COSATI, began to share with other fields, such as: numerical data, technology utilization, higher-level management of

computer-based operations, networking, information research and development; national information systems, education and training, library systems, and international sharing programs. It became evident that OST should undertake STI efforts parallel, but separate from those of COSATI. A break-through of sorts was achieved when NSF consented to provide its leadership and support to further the COSATI program.

Conclusions

As COSATI sought to extend its program to be more relevant in the Federal and private sector, it was overtaken by various pressures, mostly from OMB, to reduce its size and its presence. To the best of my knowledge, there was no effort on the part of the critics to evaluate the progress made by COSATI, what leadership role it should undertake in light of newer challenges, and to adjudge what the best role for COSATI should be in the 1970s and 1980s. It was evident that those who were urging changes in COSATI and its programs knew little about its genesis and even less about the science communications challenges ahead.

Recommendations

Among the recommendations made in the staff study were the following:

A list of potential task group chairmen, executive secretaries, members, observers, etc. should be prepared on a priority basis. To aid them, a charter or terms of reference should be prepared immediately. This should be cleared with the Director of OST in advance.
Another decision needed in advance deals with the extent of interaction with COSATI and the new task group. The task group chairman should be invited to attend all COSATI meetings. NSF authorities should be kept acquainted with what was planned and going on throughout the effort. Consideration should be given to a grant or small contract to assist the task group chairman to gather and evaluate information obtained during the course of the study. Periodic reports of progress should be delivered to the OST Director by the COSATI chairman (259).
(259) Aines, Andrew A., NSF, Memorandum (Staff Study) to Melvin S. Day, Head, OSIS, NSF, Subject: COSATI Staff Study, July 25, 1971, pp 3.

NOAA

In July 1971, NOAA formed an Environmental Science Information Center to bring together all NOAA data and documentation programs (earth, atmospheric and oceanic sciences), under the management of Dr. Thomas Austin and James Caskey. Caskey will continue to be the NOAA representative to COSATI. He voiced his approval of the Vette Panel recommendation to COSATI to form a data panel.

(260) Aines, Andrew A., NSF, Memorandum to Melvin S. Day, Head, OSIS, NSF, Subject: NOAA Changes, July 9, 1971, l page.

International

On August 24, 1971, I chaired my first meeting of the COSATI International Panel. I explained to the members why I believed the Panel's work was so

important: the explosion of knowledge meant that international
dissemination had to be re-aligned to employ new information techology and
techniques; the size, complexity and cost of new systems argue for an
international approach; STI, resulting largely from huge investments in
new R&D, takes on a new importance in the post-industrial society; all
countries will have to
improve the management of their STI programs no matter where they are
located; and even though the U.S. has the largest and most advanced ST I
program, there is no guarantee that
it will maintain its leadership. There was no disagreement expressed by
the attendees. During the meeting, discussions were held on such matters
as: a new Directory of Selected Selected Scientific Institutions in
Mainland China, undertaken by the Hoover Institution Press; two meetings
to be held to discuss the 22 recommendations of the UNISIST Report; the
request of Argentina asking the United States to join the International
Computation Center-Intergovernmental Bureau for Information Technology
(ICC-IBIT); the visit of Minister Jan Kaczmarek, leader in Polish scIence
and technology, who sought an expansion of U.S.-Polish cooperative efforts
within and outside of the current PL-480 program; a report of the OECD STI
Policy Group April 1971 meeting in Paris from Andrew A. Aines, also STI
actions undertaken by the European Common Market and member countries;
another report by Dr. Karl Willenbrock on the work of the World Federation
of Engineering Organizations (WFEO) in UNISIST and CODATA. Dr. Robert
Harte reported on joint FID and IFLA cooperation resulting from their
secretariat`s being newly located at the Hague. Dr. Russell Shank,
Director of the Smithsonian Institution Library, reported on the AID's
book program in Indonesia and elsewhere.

COSATI-Federal Library Committee Cooperation

In the latter part of 1971, the President recommended the reorganization
of the Executive Branch from seven existing departments into four:
Community Development, Human Resources, Natural Resources, and Economic
Affairs. It was recognized that such a change would have a major effect on
the the libraries and information centers of the affected agencies. OMB
and the Library of Congress suggested that COSATI and the Federal Library
Group work together in the preparation of a plan that would result in the
least amount of agency disruption, assuming that the concept of a
reorganization was consumated. In anticipation, an FLC/COSATI task force
was proposed that would operate under the leadership of John Sherrod,
Director of the National Agricultural Library, to provide direction and
guidance to a contractor aselected to do the actual work. Unfortunately,
the proposal was not put before COSATI before the selection of the
chairman and members of the ad hoc group. This was made clear in a
memorandum from Melvin S. Day to the COSATI members, who wrote:

Since COSATI did not vote on the formation of the Ad Hoc Group, and since
there would be a requirement for considerable effort on the part of the
agencies, I am interested in your views about: the involvement of COSATI
and the use of its name, the value and desirability of the study itself,
and the amount of work it many entail for your agency.

The affair was concocted in such a strange manner - OMB representatives
thoughtlessly or deliberately bypassing COSATI officials and rubbing salt

on that wound by preparing a charter for the group bearing COSATI's name - that it brought an initial negative reaction. Nevertheless, Day explained in his memorandum to the COSATI members that his request for their views "should not be considered prejudicial to the fulfillment of the objectives enunciated by the sponsors of the proposal." He made it clear that all that was requested from the COSATI members at this point was their guidance and direction.

Fortune stepped into the picture at this point. The Administration proposal to reorganize the Executive Branch was not well received in Congress and in the Executive Branch and, early on, the proposal for the joint COSATI-FLC probe was eventually abandoned (261). It was ironic that OMB, which could be depended on to oppose a widening role for COSATI, nevertheless in this instance did so. This was another indicator to me that OMB, during this period, often acted irresponsibly in the information policy area (261).

(261) Day, Melvin S., Chairman, COSATI, Memorandum to COSATI Members and Observers, Subject: Request for Views, September 7, 1987, l page. (The attachments were a proposal for a Federal Library/Information Resources Study, prepared by the FLC/COSATI AD Hoc Group Designed to Coordinate with the President's Proposed Restructuring of the Executive Branch, August 11, 1971, pp 6, and a tentative list of officers and members to serve on the ad hoc group, 1 page.

White House

During the same period, John Erlichman formed six task forces for the Domestic Council to participate in a program to improve productivity and the rate of innovation in the American economy. The large-scale effort described is summarized because of the similarity to a similar effort going on in the late 1980s. One question that intrudes is what happened during and as a result of the 1971 high level effort that would be instructional today? Another: If the problem was so clearly discernable in the 1960s and 1970s, whose responsibility was it on a continuing basis to take the necessary remedial action? This is a good and necessary question that has to do with the way our democracy works or should work,

The six task forces, as then announced, were as follows:

1. New Technology Opportunities. Chairman: Lawrence Goldmuntz, OST.

2. Technical R&D Incentives. Chairman: Ezra Solomon, CEA. (Sub-titled as Incentives to Innovation)

3. Industry, Organization and Patent Policies. Chairman: L. Engman, White House Staff.

4. Standard Practices. Chairman (unselected).

5. Restricted Labor Practices. Chairman: E. Morgan, White House Staff.

6. Technology Transfer Abroad. Chairman: E. Petty, Treasury

The timetable for the effort showed a target date of October 22-25, 1971, at which time all of the reports of the task groups would be reviewed by the Domestic Council.

The charge given by the Domestic Council or John Erlichman to the task force was:

1. To generate a more vigorous pace of innovation in civilian industry to increase productivity and, in turn, to improve the U.S. international competitive position.

2. To orient incentives, insofar as practicable, to technology opportunities in the civilian sector. The incentives and technology opportunities should be directed at basic national needs and/or economic opportunities.

Reference was made to the Magruder initiative and two previous studies undertaken by the Stein Task Force and the McCracken-David efforts done by previous study groups. One is left with the impression that serious problems are thoughfully perceived by governmental groups, studies by competent task groups are made to seek viable solutions, useful recommendations are made, but the instrumentalities, the other resources and changes that are needed to implement the recommendations, are not provided or forgotten. This form of behavior is an entropic, suicidal weakness that could spell the demise of national technological leadership and worse in the United States. It is not a weakness of unavailable knowledge or because of our ignorance, but that of laziness, inefficiency, and irresolution (262). How often are we doomed to make the same mistake?

(262) Solomon, Ezra and Alan McAdams, Council of Economic Advisers, Executive Office of the President, Washington, D.C., Memorandum to Task Force Two, Organizational Meeting for Task Force Two, September 9, 1971, app. 10 pages of memoranda and notes distributed to sub-groups of Panel Two.
These documents and others were made available to me by David Z. Beckler, Executive Assistant to the Director, OST, because I was given responsibility for reviewing U.S. Government Policy for the Dissemination of Government-Owned STI, utilizing the FCST Committee on Scientific and Technical Information.

Professional Societies

(263) Aines, Andrew A., NSF, Presentation: The U.S. Government and Chemical Information, made to the American Society of Chemical Literature, American Chemical Society, Semi-Annual Meeting, Washington, D.C., September 14, 1971, pp 14.

The talk is summarized as follows:

Chemists, perhaps more than any other group in science and technology, have demonstrated to me time and time again that they are the most interested and practiced in the effective use of STI. As a matter of fact, associates in the chemical field did much to demonstrate the importance of technical information and to convince me that there was much to contribute

to this growing effort. I hold Peppino Vlannes, Paul Olejar, David
Jacobus, Alfred Feldman, George Hager and others for my conversion. Later,
my education and training in chemical information system development came
from Milton Harris, Dale Baker, Robert Cairns, Byron Riegel, Fred Tate,
Dick Kenyon and other leaders in ACS and Chemical Abstract Service. I am
eternnmally appreciative of their patience and professionalism. While at
OST, we did all that we could to support NSF, Army and other Federal
agencies with substantial chemical programs. The key forces and trends
that those of us in the Federal STI movement are identifiable as follows:

The continuing proliferation of STI as a global phenomenon and the
tentative steps being taken to control the explosion of information and
data in all fields of science and technology.

The dramatic adoption of information technology to "control" the
literature. Mechanized information programs will continue to grow and
flourish, but as they grow so will the cost of creating and using
computerized databases and networks. This puts them into competition with
other demands for resources for science and technology in and out of the
government.

A third issue involves education, training, cultural and institutional
changes - the form and extent of reaction on the part of people and their
institutions resulting from application of new information technology.

We are moving on uncertain legs into a strange new world of information
abundance, perhaps over-abundance, which demands new information "quality
control" from all of us. This is slow process for which we are not yet
prepared psychologically and institutionally.

We must be careful as we establish an information system for science and
technology that we do not in any way curtail the open-endness of science
and technology. This can happen, if scientists turn their backs on the
communal effort to create new, sensitive, and responsive information
systems for science and technololgy.

We would be stupid to believe that the need for vital unavailable
information and data will automatically be satisfied because of the rapid
growth of R&D programs that are contributing to the rapid increase of STI.
A case in point is the requirement for the organization of a sound
information system to achieve environmental quality. Another community
that is crying for a much better information program is the marine
community. Officials in NOAA candidly admit that their present information
systems are inadequate. Tons of new STI are being generated in the weather
and health areas, but inadequate attention is being given to screening and
applying the information. That part of the apparatus is not getting the
requisite support needed. There is little likelihood that the private
sector can or will do much in this area without an influx of Federal
funds, which will alsways be hard to get.

The notion of a national information system for science and technology
makes good music philosophically, but to accomplish such a system,
there would have to be a powerful stimulus that does not seem to be in the
cards, at least, for a few decades. At best, we might be able to attain

some harmonization, some coordination, some standardization of information sevices. As I see it, the forces of dispersion and disintegration are much more powerful during this period than those that can be mobilized to achieve a national, coherent and popular STI unisystem. This will not inhibit the growth of individual information systems in the public and the private sectors
.
The expected growth of electronic databases and networks will force some support of programs facilitating interchange and intercommunication of information, of course. But, it will take a long time before the country is fully committed to forming and supporting specialized information centers, called for in the 1963 PSAC (Weinberg Panel) Report.

A higher goal to be obtained by the information community and its associates in R&D is the need for a crusade to facilitate a considerably improved technology transfer program. Only when this is universally recognized and accomplished can we really expect genuine progress in the fashioning of national information systems (263).

Greenberger Panel

At the time that the responsibility for chairing COSATI shifted from OST to NSF, Dr. David called for the formation of a panel to study COSATI and make recommendations for changes. A slate of five highly qualified candidates for chairman of the study group were referred to Dr. David for his review and selection, if he chose (264).

(264) Day, Melvin S., Chairman, COSATI, Memorandum to Dr. Edward E. David, Director, OST, Subject: COSATI Study Group, September 28, 1971, pp 2.

Professor Martin Greenberger, The Johns Hopkins University, was chosen as the chairman, and our old friend, Dr. Stephen A. Rossmassler, who had returned to the National Bureau of Standards after his stint as the Executive Secretary of COSATI, agreed to be the Executive Secretary to the COSATI Review Group. A highly capable cast - Joseph Becker, Harvey Brooks, Walter Carlson, Fred Cole, W.Conyers Herring, Jerome Luntz and F.Karl Willenbrock - were nominated to serve on the panel. The first meeting of the group was held on December 20, 1971. A considerable amount of background material was provided from FCST and COSATI annual reports, Baker and Weinberg studies, SATCOM report and others (265).

(264) Rossmassler, Stephen A., Executive Secretary, COSATI Review Panel, Letter to Members, COSATI Review Panel, Announcement of the First Meeting, December 8, 1971, pp 4.

International

OECD

In keeping with the surge of information science, technology and application in the 1960s and 1970s, OECD gave this field high priority. A series of publications was devoted to this subject. For example, in 1971, as a product of the OECD Informatics Studies, OECD released a report:

Digital Information and the Privacy Problem. The study was a product of the Expert Group on Computer Utilisation, formed by the OECD Committee for Science Policy. The work was performed by a consultant, G.B.F. Niblett. The author concluded that the computer does not merely change the way in which information is handled or communicated, "It changes the nature of what is communicated and thereby the nature of society itself...Te advent of the computer tends to upset the balance (between the rights of the individual and those of society) by moving the fulcrum in a direction which favors society at the expense of the individual...Governments can do the most to protect individuals, since the computer invasion of privacy has hardly begun." Niblett concluded with thes comments:

It (the invasion of privacy) is one form of pollution, of technololgical injury, that can be anticipated and avoided before it happens (265).

(265) Niblett, G.B.F., OECD Informatics Studies, Subject: Digital Information and the Privacy Issue, Organisation for Economic Cooperation and Development, January 1971, pp 58.

(266) Carracciolo di Forino A., et al, Committee for Science Policy, OECD, Computer Science: Problems and Prospects of Fundamental Research in Multi-Disciplinary Fields, 1972, pp 51.7

The study was performed by a group of consultants with members of the OECD Secretariat. They concluded that:

Communication and mobility of scientists, training opportunities, job opportunities, both within the university system and in the relevant industries, may be hampered by both the existing university structure and the more general structure of society in the Member countries. It was the belief of the task group that computer science is at the very heart of the present information revolution and the reason for the "quantum jump" of information-processing throughout the world. The quantum jump is both the cause and the effect of the development of computers and their applications, and is therefore the focal point of the integrated world of men and machines which is now emerging (266).